



annual report 2018

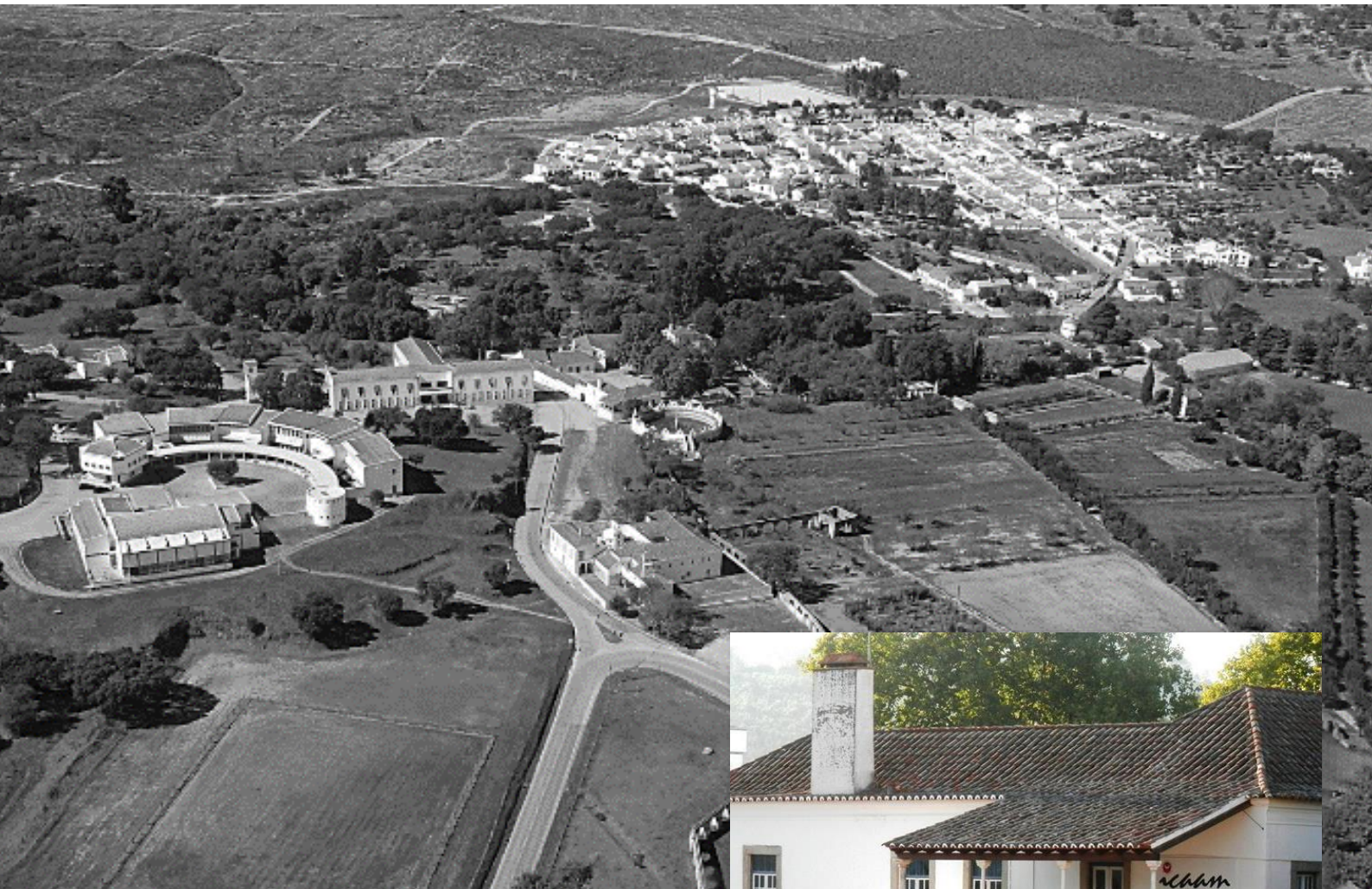


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1. INTRODUCTION

2018 has been a year marked by the preparation of ICAAM enlargement towards a new R&D Unit named MED - Mediterranean Institute for Agriculture, Environment and Development, as well as by the investment in stronger ties and collaborations across the Mediterranean basin.

The main guiding lines for the activities promoted and supported by the Board of ICAAM have been linked to ICAAM’s already defined strategy:

- Develop research that supports and contributes to the sustainability of Mediterranean agriculture and related ecosystems (ICAAM’s Mission).
- In line with ICAAM’s goals, develop and consolidate research addressing key Mediterranean sectors and systems, defined in five Thematic Lines: agro-silvo pastoral systems, olive groves and olive oil, vineyards and wine; irrigated agriculture; animal production and health.
- Strengthen research capacity and science-practice interface, creating knowledge which is relevant to practice while promoting scientific excellency.
- Enlarge networking and collaborations in the Mediterranean basin, strengthening the Mediterranean environment as the natural domain of application of our research.

ICAAM GUIDING PRINCIPLES	
Mission	<i>Promote the sustainability of Mediterranean agriculture and related ecosystems for rural development and society well-being</i>
Strategy	<i>Interdisciplinary and systems research combining different scales, designed according to questions emerging from practice.</i>
Goals	<ol style="list-style-type: none"> 1) <i>Improve the use efficiency of production inputs/resources/factors</i> 2) <i>Improve quality and increase added-value of agri-food products</i> 3) <i>Improve integrity of ecosystems and landscape multifunctionality</i>

The five Thematic Lines have continued from what was defined and developed in 2017. Research has been developed by different teams, in different research groups, supported by different labs, in a complex and dynamic structure. Nevertheless, there are clear defined goals and the research developed, contributed in multiple ways to the goals of at least one of the Thematic Lines.

Small exploratory projects integrated in one of these Lines, as well as support to PhD students and to the organization of several events have been financed by own funds. But still, the largest share of research and related activities has been financed by external, competitive funding. Only from the H2020 programme, ICAAM participated in 2018 in 9 projects, being coordinator of one of them. While this demonstrates that core funding has been limited, it also demonstrates that ICAAM has shown a strong capacity to obtain competitive funding.

Furthermore, the linkages within UNIMED, based on the UNIMED delegation in ICAAM and its coordination of the UNIMED sub-network in Food and Water have been explored, enlarged and reinforced. The Delegation in ICAAM has been active in organizing contacts and information, with the UNIMED central office but mainly with partners all around the Mediterranean basin. Morocco was selected as the first target country, and several contacts have been established, as well as an exchange visit from a delegation of ICAAM/UNIMED to different Moroccan organizations, and the preparation of joint project proposals submitted to PRIMA and to Erasmus+. Also during 2018, ICAAM researchers participated in different proposals for the PRIMA programme, being a partner in one of the few proposals approved, SUSTAINOLIVE.



2018 has been rich in networking, with an active role of ICAAM in the networks where ICAAM is part as institutional member, such as: EURAGRI, INDEHESA, Global Network on Silvopastoral Systems, RIBOLIVA, AgriBenchMark, ECOGRAM, FABRE. ICAAM has taken part in meetings and other events. Furthermore, researchers individually are members and active in many other networks. 2018 has been a year where the international recognition of ICAAM has been reinforced, with participation in consortia, coordination of project proposals and commitments to organize future large-scale scientific events, by ICAAM members and groups.

2018 has also been rich in events, scientific events as well as science-practice and science-policy interface events, which contributed to a strong recognition of ICAAM by the society, in the region, at national level and also at a broader international level.

The following sections of this Report demonstrate all these activities and achievements, and much more.

2. ABOUT US

The Institute of Mediterranean Agricultural and Environmental Sciences (ICAAM) is a Research and Development Unit at the University of Évora. ICAAM is located at “Campus da Mitra”, an experimental farm covering 285 ha in Alentejo (southern Portugal), 12 km from the city of Évora.

OUR GOALS ARE:

To develop Knowledge contributing for the sustainability of Mediterranean agriculture and associated ecosystems, through:

1. The efficiency in the use of production factors;
2. The quality and added-value of agri-food products;
3. Ecosystems integrity and landscape multifunctionality

OUR WORK IS BASED ON:

- System Approach
- Interdisciplinarity and multidisciplinary
- Interaction with Stakeholders
- Multiple Scales
- Questions emerging from practice

The ICAAM develops its activities based on multidisciplinary teams comprising researchers from the areas of Agricultural Engineering, Animal Science, Agronomy, Biology, Physics, Chemistry, Ecology, Economy, Landscape and Territory, Soil Science and Veterinary.

Through cooperation with other national and international I&D institutions, the work allows to achieve: understanding the complex Mediterranean production systems and to promote technological innovation as a means of responding in an integrated manner, to the social, economic and technical needs in the field of agriculture, while preserving natural resources and environmental quality.

BRIEF ACCOUNT OF ICAAM HISTORY

The origins of ICAAM go back to 1991 when the concept of a new research centre was developed and took shape through a process led by Professor José Antunes Afonso de Almeida.

The ICAAM was launched at the University of Évora, under the framework of the National Science Program of that period. It was ICAM: Instituto de Ciências Agrárias Mediterrânicas. The Centre was completely integrated in the University, where it took care of research on agriculture and experimental development. Integrated researchers were almost totally professors at the University.

The Centre was reorganized in 2007 and evaluated through the FCT national evaluation process in 2008. Before this evaluation, the centre had enlarged its scope, also including environmental research beside the core business on agricultural science. Thus, the name had changed to ICAAM: Instituto de Ciências Agrárias e Ambientais Mediterrânicas. Besides an enlargement in scope, research funding expanded to different sources, and competitive international funding progressively took a more relevant role. Also, the pattern of researchers changed, including progressively more full-time researchers, not linked as professors to the University. The centre was again evaluated in the national evaluation process of 2013, what launched a new re-organization, this time in overarching Thematic Lines, focused on production sector and systems characteristic of the region of Alentejo and the Mediterranean basin. The centre is thus now organized in research groups, with similar research objects and specific competences, and thematic lines, to which

research goals converge. From each group, researchers may contribute to one or more of the existing thematic lines.

In 2018 ICAAM has continued its effort to have a clear strategic position and goals, to gather researchers and combine efforts in order to develop the thematic lines of research. The Centre has intensified its international presence and invited new centers to join the ICAAM in order to form a new Centre - The MED- Mediterranean Institute for Agriculture, Environment and Development.

3. STRUCTURE DESCRIPTION AND CHART

BOARD OF DIRECTORS

Ensures the regular management of the Institute, according to the plans and budget approved by the Scientific Council. The Director is the elected President of the Scientific Council and nominates the Vice-Directors.



DIRECTOR

Teresa Pinto Correia (mtpc@uevora.pt), President of the Scientific Council, Director
Full Professor, PhD in Geography, University of Copenhagen, Denmark

VICE-DIRECTORS



Fátima Baptista (fb@uevora.pt), Vice-Director
Assistant Professor with Habilitation, PhD in Agricultural Engineering,
University of Évora, Portugal



Gottlieb Basch (gb@uevora.pt), Vice-Director
Associate Professor, PhD in Agricultural Sciences, University of
Göttingen, Germany



Maria João Cabrita (mjbc@uevora.pt), Vice-Director
Assistant Professor with Habilitation, PhD in Agricultural Sciences,
University of Évora, Portugal

SCIENTIFIC COUNCIL

ICAAM's **Scientific Council** is composed of all eligible PhDs (i.e. PhDs who comply with predefined standards of scientific production). Its functions include the discussion and approval of scientific and financial reports, plan of activities and budget as well as the admission of new members. The President of the Scientific Council is elected for 3 years and assumes the functions of Director of the Institute.

PERMANENT COUNCIL OF THE SCIENTIFIC COUNCIL

The Permanent Council of the Scientific Council advises the Board of Direction on current affairs. It is formed by the members of the Board of Direction and by the Coordinators of the Research Groups.

EXTERNAL SCIENTIFIC ADVISORY BOARD

Formed by international experts in the scientific areas of ICAAM that periodically evaluate ICAAM's activity and achievements.

- Gad Baneth – Director of Koret School of Veterinary Medicine, Hebrew University (Israel), Professor of Veterinary Medicine. The Rybak-Pearson Chair in Veterinary Medicine.
- Hubert Wiggering - Professor of Geo-ecology at the University of Potsdam, Institute for Earth and environmental sciences. Scientific Director of the Leibniz-Centre for agricultural landscape research (ZALF) in Müncheberg.

External Observer - Michael J. Goss. Editor-in-Chief of the Soil Use and Management Journal. Professor Emeritus. School of Environmental Sciences, University of Guelph, Ontario, CANADA.








EXTERNAL STAKEHOLDER PANEL

The ICAAM External Stakeholder Panel arised from the need to establish an interaction between research and actors on the region in the agricultural sector, in the food value chain and in the management of the environment and resources.

ICAAM wants that its Stakeholder Panel be a privileged area of discussion and consultation at regional and national level on the ICAAM's strategy and activities, which will ensure a better link to practice as a whole, considering the various potentialities and problems that characterize the south of Portugal.

During the year of 2018 the stakeholder Panel met twice, in January and in May.

	Participant Institutions	Name of the Representing
	Associação de Agricultores de Alcácer	Eng. Francisco Vacas (President)
	Associação dos Jovens Agricultores do Sul	Eng. Diogo Pestana Vasconcelos (President)
	Associação de Criadores de Porco Alentejano	Eng. Nuno Nobre Faustino (President)
	Associação de Agricultores do Baixo Alentejo	Eng. Francisco Palma (President)
	Associação de Criadores de Bovinos Mertolengos	Eng. Eduardo Jorge Mira Cruz (President)
	Associação Nacional de Criadores de Ovinos de Raça Merina	Eng. Tiago Perloiro (Technical Secretary)
	União da Floresta Mediterrânica	Eng. ^a Conceição Santos Silva (I&D + i Manager)
	Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo	Dr. ^a Fátima Duarte (Scientific Coordinator)
	ACOS - Associação de Agricultores do Sul	Eng. Claudino de Matos (General Director)
	Adega Mayor – Grupo Nabeiro	Dr. ^a Rita Nabeiro (General Director)
	Confederação dos Agricultores de Portugal	Eng. Luís Miguel Correia Mira (Secretary general)
	CVRA - Comissão Vitivinícola Regional Alentejana	Eng. ^o Francisco Mateus (President)
	Comunidade Intermunicipal do Baixo Alentejo	Dr. Fernando Romba (Secretary general)
	Direção Regional de Cultura do Alentejo	Dr. ^a Ana Paula Amendoeira (Director)
	Turismo do Alentejo ERT (Entidade Regional de Turismo)	Dr. José Manuel Santos (Secretary general)
	Esporão SA	Dr. Nuno Gaspar de Oliveira (Ecosystem Manager) Dr. ^a Ana Carrilho (Olive Oil manager)

Participant Institutions	Name of the Representing
 <p>Empresa de Desenvolvimento e Infraestrutura do Alqueva s.a</p>	<p>Eng. Diogo Nascimento (Director-Coordinator) Eng.ª Bárbara Tita (Sustainability Department Manager)</p>
 <p>Monte ace - Desenvolvimento do Alentejo Central</p>	<p>Dr.ª Marta Alter (Technical Director)</p>
 <p>Portalimpex L.da</p>	<p>Eng. Nuno Marques (Entrepreneur and producer)</p>
 <p>FEA</p>	<p>Eng. Pedro Baptista (Enologist from Cartuxa Winery)</p>
 <p>Terrius Lda</p>	<p>Eng.ª Rita Beltrão Martins (Entrepreneur) Eng. Filipe Verdasca (Entrepreneur)</p>
<p>Herdade da Camoeira</p>	<p>Dr. Caetano Oliveira Soares (Entrepreneur and producer)</p>



ADMINISTRATION AND FINANCE

The administrative team ensures communication with the central administration of the University of Évora in conformity with the established procedures.



Luís Cláudio Arraiano (lpa@uevora.pt; icaam@uevora.pt)



Fernanda Seabra (fmos@uevora.pt; icaam@uevora.pt)

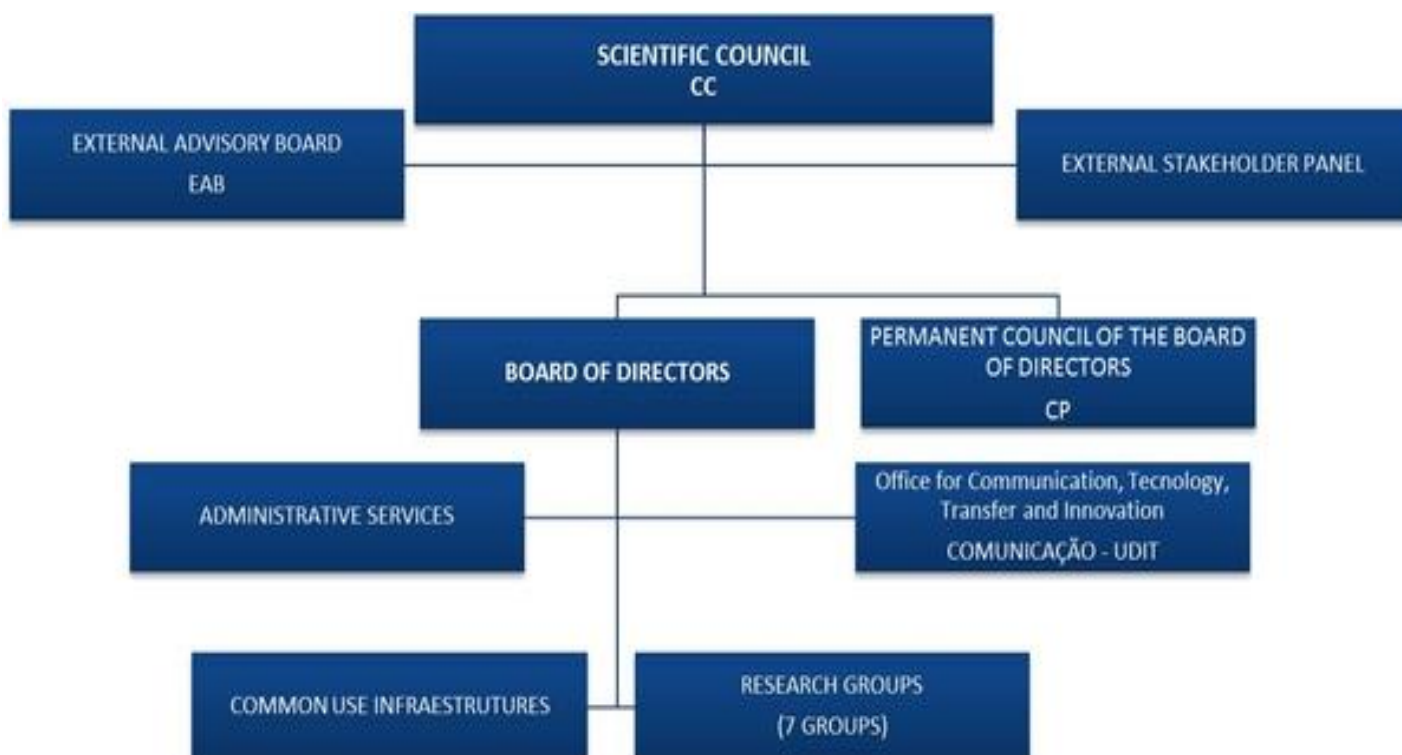
COMMUNICATION OFFICE (UDIT)

The **Office for Communication, Technology Transfer and Innovation (UDIT)** is dedicated to the dissemination of Research & Development results and to the promotion and transfer of technologic innovation, thus contributing to science outreach and regional development. It is also this office that manages the database of researchers and their scientific production.



Patrícia Vacas de Carvalho (pvc@uevora.pt; udit_icaam@uevora.pt), UDIT Coordinator
Management and Science Communication

ORGANIZATION CHART



RESEARCH ORGANIZATION IN ICAAM

ICAAM's researchers and scientific activity are organized in 7 Research Groups that represent different perspectives and research objects.

During the year of 2018 the ICAAM has defined a set of 5 Thematic Lines in order to organize the research in the unit and to better answer the questions which arise from the practice.

RESEARCH GROUPS

1. **Animal Biosciences (ABG)**
2. **Food Science and Technology (FST)**
3. **Plant Protection (PP)**
4. **Genetic Resources and Functional Genomics (GRFG)**
5. **Landscape, Biodiversity and Socio-Ecological Systems (LABS)**
6. **Soil, Water and Climate (SWC)**
7. **Farming Technology and Energy Efficiency (FTE)**

THEMATIC LINES

The heterogeneity in research competencies is explored in 5 Thematic Lines, each coordinated by a chairperson:

- 1) Olive Groves e Olive Oil;
- 2) Vineyards and Wine;
- 3) Animal Production and Health;
- 4) Agro-Silvo-Pastoral Systems – Montado;
- 5) Irrigated Agriculture.

OLIVE GROVES
OLIVE OIL



Innovation replying to questions
emerging from practice

AGRO-SILVO-
PASTORAL
SYSTEMS



ANIMAL
PRODUCTION AND
HEALTH



Increasing disciplinary
interaction

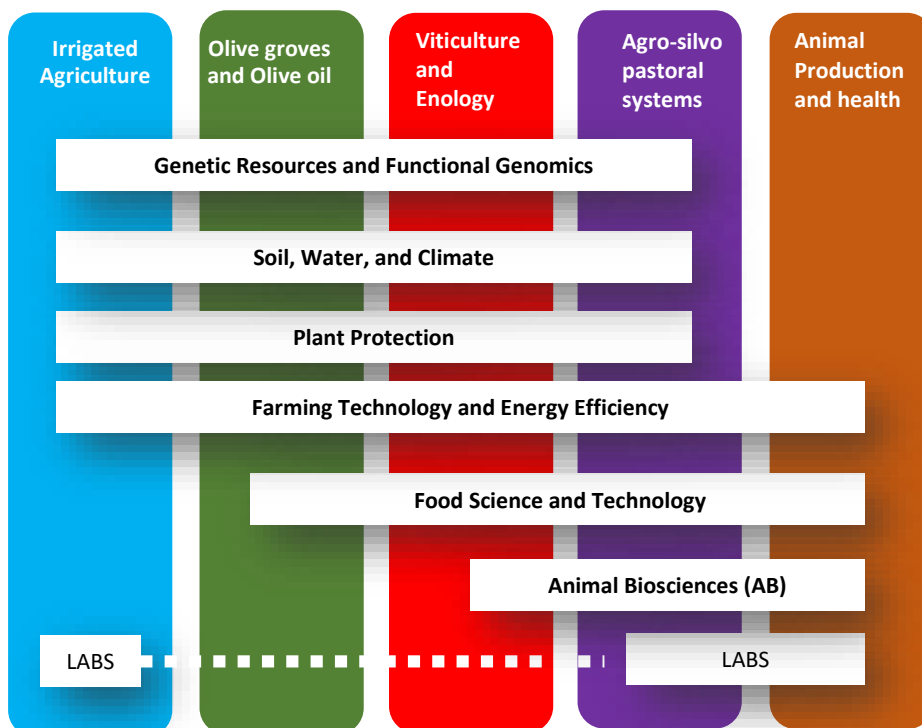


IRRIGATED
AGRICULTURE



VINEYARDS AND
WINE

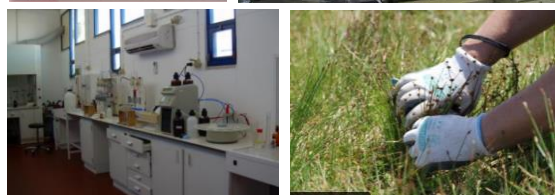
The Thematic Lines, as the backbone of the research groups, contributes to several priority lines oriented to solve research questions emerged from practice.



INFRASTRUCTURES

The centre has common infrastructures to be used by any researcher at ICAAM. This means that laboratories are ICAAM's independent support structures for general use with the projects, not specific to any research group or researcher.

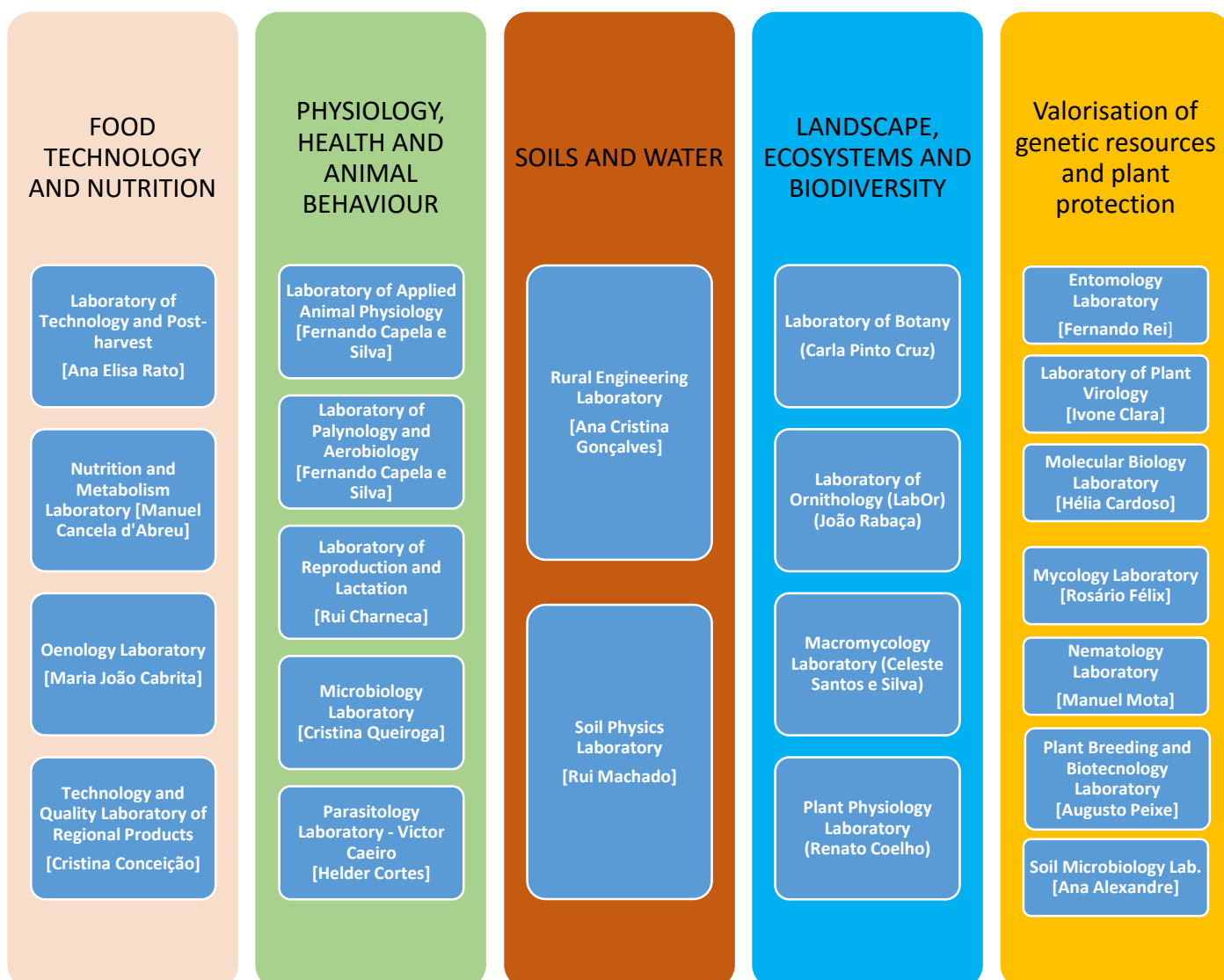
ICAAM's facilities include 22 laboratories and 10 experimental support units that are available to all ICAAM members and authorized visitors.



LABORATORY AREAS

- **FOOD AND NUTRITION TECHNOLOGY**
- **PHYSIOLOGY, HEALTH AND ANIMAL BEHAVIOR**
- **SOILS AND WATER**
- **LANDSCAPE, ECOSYSTEMS AND BIODIVERSITY**
- **VALORISATION OF GENETIC RESOURCES AND PLANT PROTECTION**





EXPERIMENTAL AREAS

RESPONSIBLE - AUGUSTO PEIXE, ASSISTANT PROFESSOR

Plant Growth Chambers - Augusto Peixe, Assistant Professor

Ultra-low Freezers - José Manuel Martins, Assistant Professor

Olive Oil Experimental Plant - Miguel Elias, Assistant Professor

Animal Experimentation - Elvira Sales Baptista, Assistant Professor

Advanced Microscopy and Citometry Unit - Luís Manuel Cardoso Vieira Alho, Assistant Professor

Geotechnology Equipment - José Rafael Marques da Silva, Assistant Professor with Habilitation

Greenhouses Complex - Rui Almeida Machado, Assistant Professor

Plant Material Processing - José Manuel Godinho Calado, Assistant Professor

Field Equipment - Margarida Vaz, Assistant Professor

Experimental Plots - Luís Gazarini, Associate Professor

- 3 Plots of Spontaneous Vegetation
- 2 Plots of Forest experimentation
- 1 Plot of Monitoring Technologies for the Montado

RESEARCH GROUPS HIGHLIGHTS

GROUP: ANIMAL BIOSCIENCES (ABG)



HEAD OF GROUP: Elsa Leclerc Duarte, jemld@uevora.pt, Assistant Professor at the Department of Veterinary Medicine, University of Évora

INTEGRATED MEMBERS: 34 members

PhD STUDENTS: 10 Students

[See List point 14 - ICAAM Members]

Keywords: Biomarkers of health and disease | Autochthonous animal breeds | One Health | Animal welfare

Major Competences of the Group

This is a multidisciplinary Group that comprehensively covers all aspects of animal bioscience, from fundamental research in biochemistry, physiology and genomics, to problem-based applied research on animal production systems and related technologies. The disciplinary-based key competences allows research at the molecular, cellular and tissue level, as well as in-vivo approaches related to farm, companion animals and wildlife. Cross-cutting approaches to human and animal health have been addressed, particularly:

- 1) new phytopharmaceutical compounds to improve animal and human health;
- 2) behavior, welfare and health related biomarkers for the diagnosis of degenerative joint diseases, fertility, thermoregulation and adaptation to extreme climate conditions, food intake and diet preferences;
- 3) characterization of the salivary proteome and lipidome and its relation to health, taste and feeding strategies;
- 4) animal genetics and genetic basis of production parameters and disease resistance, particularly in Mediterranean autochthonous animal breeds;
- 5) trending and (re)emergent animal or zoonotic diseases in the Mediterranean context including farm, companion, wildlife and game species and their consequences for production, welfare and Public health.

The Group holds specific competencies in resource efficiency (efficient and robust animals/efficient food chains), and healthy livestock and people (prevention, control and eradication/ the microbiome, animal end human health). The Group is actively committed to contributing to the thematic lines on Animal Production and Health, but also to Irrigated agriculture, Montado and Biodiversity.

MAJOR ACHIEVEMENTS IN 2018

In 2018, ABG research group has covered all aspects of animal bioscience, from fundamental research in biochemistry, physiology and genomics, to problem-based applied research in animal production systems and technologies.

The experimental farm facilities, ICAAM laboratories and CEBAL laboratory have allowed researchers to address transversal themes to human and animal health, as well as to perform research within the frame of

several production systems. Particular research efforts have been made in the areas of new phytopharmaceutical compounds, reproduction and diagnostic technologies, OMIC tools, animal genetics and genetic basis of disease resistance, autochthonous breeds' resilience, animal ecology and welfare, wildlife and game species health. The ABG has actively contributed to the strategic thematic lines drawn for ICAAM for the years ahead, in particular, the animal production and health programme, but also the irrigated agriculture, agro-silvo-pastoral systems (montado) and the biodiversity and climate change programmes. Research themes were aligned with the *animal task force* top research priorities drawn by the European Union, in particular Resource efficiency (efficient and robust animals/Efficient food chains) and Healthy Livestock and People (prevention, control and eradication/ the microbiome, animal end human health).

Additionally, ABG members actively participated in the recently formed Animal Welfare Body of the University of Évora, that certifies the compliance of ethical standards in all projects with experiments involving animals.

The projects and publications of the group in 2018 reflect:

- 1) The fulfilment of the challenges launched by the regional smart specialization strategy for the ALENTEJO region, with several A2020 regional funding programmes. These programmes included four research programmes: 1- SelectPorAl: genetic improvement of Alentejano Pork breed 2- CISTUSRUMEN: C. ladanifer use in small ruminants feed 3- GenRESAlentejo: genomics to select resistant sheep to foot roth and parasites 4- ValBiotechCynara: valorisation of Cardon and biotechnological applications. Also, three technology transfer programmes for bottom-based research approaches were funded, allowing to meet different regional stakeholders' demands, in particular, animal breeding associations and regional research centres/laboratories. These programmes have enabled the modernization of important infrastructures in several University of Évora campus. The funded programmes include technical support to conservation programmes and genetic improvement of ruminants, reproductive management and biotechnology of reproduction in the Lusitanian horse, and new methodologies to assess the diagnosis of articular disease in the horse. The two latest have supported the recovering of the Alter do Chão equine clinics facilities of the University of Évora.
- 2) ABG researchers have broadened international networks by cooperating with different research institutions and private sector players, in particular a H2020 R&D programme TREASURE-on local pig breeds, production systems and pork chains. An ABG member was present in several meetings of the European FABRE platform, an industry-led platform of breeding and reproduction organisations and institutes. Members of ABG were involved in 4 COST actions: NEOH- Network for Evaluation of One Health; CYSTINET- European Network on Taeniosis/Cysticercosis DAIRY CARE Biomarker-based Welfare Technologies Working Group and SOUND CONTROL Non regulated diseases of cattle.
- 3) ABG continued to be deeply committed to education, science communication and public awareness throughout several outreach activities to students and the general public. Several sessions with students and stakeholders were organized as outreach activities from the ongoing projects Several ABG members were dedicated to undergraduate and post-graduation education, in particular by supervising several PhD students from the PhD programme in Veterinary Science, Biology and Biochemistry.

ISI / SCOPUS PUBLICATIONS - 44

(Numbers referring to the complete list in Point 13)

1;2; 3;19;21; 24; 26; 29; 31; 32; 40; 41; 43; 49; 51; 52; 61; 66; 70; 71; 72; 73;74; 77; 80; 81; 82; 83; 88; 91; 92; 103; 105; 106; 107; 109; 112; 118; 119; 120; 121;124;131;132

BOOK AND BOOK CHAPTERS – 5

B9, B12, B8, B10, B13

RESEARCH PROJECTS – 17

(Numbers referring to the complete list in the Point 7)

[22], [23], [24]; [26], [27], [34]; [50], [51], [62]; [64], [67], [70]; [74], [75], [76]; [78], [81]

GROUP: FOOD SCIENCE AND TECHNOLOGY (FST)

HEAD OF GROUP: Miguel Elias, [elias@uevora.pt], Assistant Professor at the Plant Production Department, University of Évora

INTEGRATED MEMBERS: 15

PhD STUDENTS: 3

[See List point 13 - ICAAM Members]

Keywords: Food safety and quality | Shelf life extension | Mediterranean food

Major Competences of the Group

The FST group has competences to perform microbiological and physicochemical analyses, including spectrophotometric determinations and chromatographic analyses, as well as sensory analyses, in different food matrices that include fruits, cheeses, meat and meat products, olives and olive oil, grapes and wine.

Several laboratories, as well as other common infrastructures, are used by the members of the FST group, in conducting their research, namely Oenology, Technology and Post-Harvest, Microbiology, Experimental Winery and Olive Mill.

MAJOR ACHIEVEMENTS IN 2018

- Advanced selective sample preparation methodologies for the trace analysis of pesticide residues in olive oil samples.
- Use of natural preservatives such as organic acids (vinegar) or aromatic plants (and their essential oils) in increasing safety of different foods.
- Discrimination of olive oils, using methodologies that allows the determination of their geographic and varietal origin.
- Alternative food-preservation and post-harvest technologies to increase shelf-life of high-quality foods.
- Determination of fruit ripeness and quality using Near Infrared Spectroscopy (NIRS).
- Alternative technologies using oenological relevant woods to age wine spirits, improving and not depreciating the sensory and chemical characteristic of the wines. Several ongoing projects with companies from the agri-food sector as partners (operating groups).

ISI / SCOPUS PUBLICATIONS - 14

Numbers referring to the complete list in Point 13)

20; 25; 26; 37; 54; 55; 56; 73; 82; 83; 91; 101; 105; 106.

BOOK AND BOOK CHAPTERS –2

B4, B5

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 7

(Numbers referring to the complete list in Point 7)

[47], [53], [55], [63]; [72]; [80]; [84]

GROUP: PLANT PROTECTION (PP)

HEAD OF GROUP: Mário Carvalho, [mjc@uevora.pt], Full Professor at the Plant Production Department, University of Évora **INTEGRATED MEMBERS: 19**

PhD STUDENTS: 4

[See List point 13 - ICAAM Members]

Keywords: Beneficial soil microbes | Abiotic and biotic stresses | Low input strategies
| Economic and environmental sustainability

Major Competences of the Group

The Plant Protection group focuses the development of low environmental impact plant protection strategies that combine the use of beneficial soil microbes, integrated pest and disease management and plant nutrition approaches.

The Soil Microbiology Lab addresses the biology of plant beneficial microbes and its use in agricultural systems. Our research focuses on rhizobia and other plant-growth promoting bacteria as well as on arbuscular mycorrhizal fungi, in order to improve plant nutrient acquisition and alleviate biotic or abiotic stresses. The abiotic stresses under study are those associated to heat, salinity and soil acidity. On the other hand, biotic stresses caused by soil phytopathogens, namely *Fusarium* spp. and nematodes, are also addressed. Studies on the soil communities functional diversity and on the mechanisms involved in plant-microbe interactions are also an important part of our research.

The competences of the Laboratory of Plant Mycology and Laboratory of Plant Virology are: 1) Studies on endophytic fungi with antagonistic activity against important fungal pathogens such as *Colletotrichum* spp. that cause olive anthracnose, *Spillocaea oleagina* and *Cercospora cladosporioides* that cause olive leaf spots, *Guignardia bidwellii* that cause black rot in grapevine and *Fusarium* spp. that potentially cause decline of almond trees; 2) Genetic diversity studies on *Fusarium* spp. and *Cephalosporium maydis* from different countries and different varieties of maize; 3) Detection and quantification of important plant pathogens through qPCR; 4) Analysis through NGS (New generation sequencing) of the fungal trunk disease population in the major grapevine cultivars from Alentejo region; 5) Strategies using VIGs vectors for knock out or overexpression of genes responsible for susceptibility or tolerance to pathogens in olive, grapevine and other crops; 6) Detection, quantification and characterization of the main viruses of olive, grapevine and sweet potato present in several fields in Alentejo region and in different cultivars, using molecular techniques; 7) Study and characterization of olive necroviruses and their potential use in the control of diseases caused by other viruses in economically important crops; 8) Development of rapid and sensitive diagnostic methods for simultaneous detection of viruses in several crops; 9) Construction of infectious viral clones and protein function studies; 10) Search for silencing suppressor genes in viruses of the genera Alpha - and Betanecrovirus.

The competences of the Nematology Lab (NemaLab) are in 3 main areas: (1) Research on plant parasitic nematodes as well as interactions with plants and microbes; (2) Support for teaching students (undergraduate and graduate) as well as post-docs; (3) Outreach and Extension, providing technical services, namely soil and plant analyses, to official institutions (e.g. ICNF/ MADRP) as well as to growers and ag companies (e.g. Bayer, VITICERT, golf courses, etc...).

The laboratories of Entomology and Mycology focus on integrated pest management related to the knowledge of their organisms and control methods as well methodologies for their limitation. The competences are in 3 main areas: 1) Advances on olive pests and diseases biology and population genetic structure and diversity: Pests - Diversity and genetic structure of *Bactrocera oleae* and Prays *oleae* populations in Portuguese olive groves; Diseases - Diversity and structure of populations of *Colletotrichum* spp. and knowledge about the biology of the disease in the olive tree, namely of its forms of plant infection; Knowledge and evaluation about the presence of *Xylella fastidiosa* insect vectors - associated to the olive quick decline syndrome - in the olive grove ecosystem, and formulation of risk maps associated with the potential risk of olive trees infection by the bacteria; 2) Knowledge advances about the negative impact associated with the use of chemical control for key pest control: Evaluation about the resistance levels on *B. oleae* in Portugal and Spain olive groves, to the main insecticide - dimethoate – applied against olive fly; 3) Knowledge on non-chemical control methods alternatives to chemical control to be used on olive integrated pest management: Biological control - Knowledge about the diversity and population structure of predators and parasitoids associated to the functional arthropod fauna of the olive grove ecosystem, with potential for olive key pests control; Knowledge about the presence and diversity associated to endophytic fungi on olive canopy, with potential antagonistic action against *Colletotrichum* sp.

MAJOR ACHIEVEMENTS IN 2018

Thesis: 2 PhD thesis; 5 Master thesis.

Collaborations

- Establishment of soil enzymes analysis techniques according to ISO 20130:2018(E);
- Contract with private entity for scientific study (€ 22 920) – coordination;
- Performance of viral diagnostic tests in sweet potato plants with the aim of obtaining virus-free plants – in collaboration with Plant Breeding and Biotechnology Laboratory – ICAAM;
- Detection of endophytic fungi and their study as antagonists of the main grapevine diseases – in collaboration with Fundação Eugénio de Almeida;
- Collaboration in diagnosis of plant pathogens for several private companies: Fertiprado, Corteva Agriscience, Bayer-Monsanto, Fundação Eugénio de Almeida, Sociedade Agrícola Torre de Figueiras.
- Carla Varanda and Maria do Rosário Félix are members of the Management Committee in European Cooperation in Science and Technology in the current COST action FA1407 - ‘Application of next generation sequencing for the study and diagnosis of plant viral diseases in agriculture’
- Collaboration with Dr. Maher Chaouachi, High Institute of Biotechnology in Monastir (ISBM), Tunisia, Laboratory of Genetic, Biodiversity and Valorization of Bioresources – with a financed bilateral cooperation.
- Protocol with North and Centre Regional Agencies of Agriculture Ministry;
- Protocol with Farmers Association for the Integrated Production of Mountain Fruits (Associação Agricultores de Produção Integrada dos Frutos de Montanha -AAPIM);
- Protocol with Technical Association of Winemakers of Alentejo (Associação Técnica dos Viticultores do Alentejo – ATEVA);Esporão S.A (Wine Company).

ISI / SCOPUS PUBLICATIONS - 20

Numbers referring to the complete list in Point 13)

4; 16;17; 18;23; 35; 42; 44; 64; 84; 85; 86; 95; 111; 123; 133; 135; 136; 137; 145

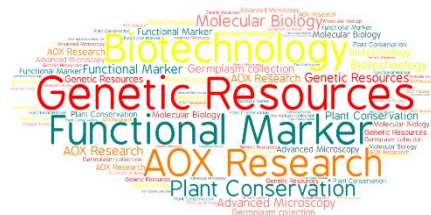
BOOK AND BOOK CHAPTERS – 4

B4, B5, B16, B21

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 10

Numbers referring to the complete list in Point 7)

[31], [32], [36], [37], [65], [68], [69], [77]; [82]; [83]

GROUP: GENETIC RESOURCES AND FUNCTIONAL GENOMICS (GRFG)

HEAD OF GROUP: Tânia Mesquita Nobre [tnobre@uevora.pt], Researcher, PhD in Life Sciences, Universidade de Évora

INTEGRATED MEMBERS: 11

[See List point 13 - ICAAM Members]

Keyword(s): Plant biotechnology | Molecular diagnostics and markers | Phenotype-genotype associations | Gene functional analysis

Major Competences of the Group

The group has a strong research emphasis on plant responses to both abiotic and biotic stresses, reproductive biology at the level of the gene to the crop production system, and breeding for enhanced performance in a resource-limited environment. Research tends to a holobiotic approach of the organisms and focus on Mediterranean relevant species and particular challenges. The research focuses thus on integrated genetic studies, including transcriptomics and metabolomics, of major Mediterranean crop – mainly but not exclusively olive groves, “Montado” and vines – towards a basic understanding of the mechanisms underlying growth, development, and responses to abiotic and biotic stress. This knowledge is to be applied in increasing plants yield and resistance, improved crop quality, and tolerance to stresses. The research also extends to the development of molecular markers for given traits and to the molecular diagnosis of both plant diseases and functional symbiotic consortia. The group’s links to breeding and agro-biotechnology Industries promote good levels of knowledge transfer (and contributes to advances in translational science).

Infrastructure uses relate to Biotechnology, Molecular Biology, Biochemistry, Calorespirometry, Oxygraph Carbon Isotope Analyser, Advanced Microscopy (Confocal and Microdissection). The group is engaged to strengthen not only innovation in scientific thinking and performance, but also in specific technology development towards problem solving. In this frame, the main key-words defining the competences of the researchers are: plant propagation; in vitro culture; plant breeding; marker assisted selection; plant stress responses; calorespirometry; phenotyping and genotyping; phenotypic plasticity; phenotype-genotype associations; genetic handling; gene isolation and genomics; gene functional analysis; epigenetic gene regulation; transcriptomics; single cell genomics/transcriptomics; knowledge transfer.

MAJOR ACHIEVEMENTS IN 2018

Apart from the achievements directed related with research outcomes, and that are clear from publication and project list, in 2018 a bilateral cooperation was established between University of Évora and the Krakow Farming University (Poland) in the frame of the Erasmus Program (contact researcher Dr. Dariusz Grzebelus, d.grzebelus@urk.edu.pl, Plant Biology and Biotechnology institute). This cooperation, adding to the track record of collaborations with other universities and several private companies and producers, will keep adding value to the research made within the group.

On the dissemination to target groups, the two-folded workshop that was hold on 14th December 2014, was a success, bringing into contact researchers and producers/companies of two iconic crops of the region: a)

olives: “Valorização das variedades de oliveira Portuguesas” and b) grapes: “Table Grape Breeding: Development of new varieties to overcome old problems and to reach new consumer demands”.

At the end of the pipeline from fundamental research to practical application, the company DespertaFolia Lda was created, a Spin-off of UÉvora. It is a StartUp that resulted from the Operação ALT20-03-0246-FEDER-000002 – “Viabilização da cultura da noqueira no regadio do Alentejo – “VALREGIA”. The company started its activity in 12-03-2018 and has already produced 13 273 in vitro plants of the ‘Vlach’ walnut rootstock, a hybrid between J.Hindsii x J.Regia particular relevant for the conditions in Alentejo. Additionally, the company is producing plants of the cultivar ‘Galega vulgar’ and virus free plants of the sweet-potato cultivar ‘Lira’. The first field trials with this last species gave interesting results, with an average production per hectare of 28 Ton, more than twice of the normal yield with contaminated plants.

ISI / SCOPUS PUBLICATIONS - 11

Numbers referring to the complete list in Point 13)

16; 22; 23; 38; 67; 85; 86; 97; 101; 111; 134

BOOK AND BOOK CHAPTERS – 2

B2, B19

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 6

(Numbers referring to the complete list in Point 7)

[8], [30], [35], [69]; [77]; [79]

LANDSCAPE, BIODIVERSITY AND SOCIO-ECOLOGICAL SYSTEMS (LABS)

HEAD OF GROUP: Carla Pinto-Cruz, [ccruz@uevora.pt], Assistant Professor at the Biology Department, University of Évora

INTEGRATED MEMBERS: 32

PhD STUDENTS: 13

[See List point 13 - ICAAM Members]

Keyword(s): Biodiversity monitoring and conservation | Ecosystem processes and services | Habitat recovery | Landscape fragmentation and connectivity

MAJOR COMPETENCES OF THE GROUP

- a) Modelling tree stand dynamics in relation to management factors supporting adaptive management at different scales
- b) Use of geo-information data (e.g. remote sensing data) and the recent advances in computation science (e.g. big data analysis, machine learning, and data mining) to monitor main activities, trends and consequent system changes, towards a better integrative modelling of the socio-economic and natural process of the agro-silvo pastoral systems
- c) Understanding and characterising management options considering both private and public actors, integrating different types of actors and informing public policies
- d) Progressing in multi-actor research and co-construction of knowledge by guiding participatory processes and applying transdisciplinarity methods
- e) Biodiversity monitoring and conservation – defining effective methods to monitor how human disturbance affects biodiversity (including plants, freshwater communities, and terrestrial vertebrates)
- f) Ecosystem processes and services – analysing species interactions and ecosystem services
- g) Designing and implementing conservation measures for species and habitat recovery

MAJOR ACHIEVEMENTS IN 2018

- 1) INTER AND TRANSDISCIPLINARITY (ITD) are being tested so that scientific knowledge can evolve at the pace of societal changes and knowledge demand. This group has innovated in long-term transdisciplinary processes that include partnerships between societal actors, policy and decision makers and researchers towards knowledge co-construction and landscape management, particularly tailored to Mediterranean context. This is illustrated by the Tertúlias do Montado, a regular open discussion meeting organized by the group since 2016, involving all types of actors dealing with the Montado. The group strongly contributes to the state of the art regarding the theory of ITD and improvement of such research processes by the testing of tools (e.g. conceptual modelling, Q methodology, systems thinking and the social-ecological framework).
- 2) The group has been innovative in the USE OF REMOTE SENSING TOOLS TO UNDERSTAND LANDSCAPE CHANGE. Understanding when, where and how the Mediterranean agro-silvo pastoral landscape changes is

important to develop new insights into the spatio-temporal dynamics and long-term resilience of the system. The variation of tree and shrub cover density over time is the major change, demanding the urgent development of a comprehensive monitoring programme. Therefore, regular and accurate land cover information at high spatial resolution is essential. The group has proved the usefulness and effectiveness of remote sensing techniques and advanced image classification methods for producing accurate and up-to-date land cover information as a key data source to understand the local effects of landscape change.

3) The group contributed to improve MONTADO MANAGEMENT AND PRODUCTIVITY. Montado agro-silvo pastoral systems have faced chronic dieback over several years. The group studied and developed new tools to understand the decline and lack of regeneration and to mitigate the problems. Using new 3D techniques to map the root system, the group found that the most usual soil management type (soil disking) has a deleterious effect on root survival, particularly functional roots responsible for the access to deep-water resources. Since 2014 the group has also tested new precise irrigation techniques to improve the growth and health of new cork oaks plantations, in the context of climatic changes. These findings can provide an essential tool for future forest planning and management and for the natural and artificial regeneration processes in cork oak stands, ensuring the maintenance of the typical Montado landscape.

4) The group improved the USE OF BIRDS AS INDICATORS. Consistent long-term work has contributed to clarify how bird communities are modulated by management practices in Mediterranean woodlands; understand the regulating role of top predators; determine the services provided by birds (e.g. pest control, tourism); and improve bird monitoring methods. It reached broad dissemination by organizing an international congress (WOC2017) and integrating networks with relevant outputs on long-term bird monitoring and citizen science: 3rd Portuguese breeding bird atlas (SPEA/ICNF); European Breeding Bird Atlas; EuroBirdPortal (the largest platform of citizen science in Europe); European networks using raptors to biomonitor environmental threats (ESF-EURAPMON, ERBF COST CA16224). This activity reaches stakeholders, with projects involving public companies (Companhia das Lezírias, EDIA), forestry associations (ASFOALA, APFC), and private landowners, and also with publication of a book directed to land managers about the role of birds as tools for a sustainable development of Montado areas.

5) The group developed EFFECTIVE SPECIES AND HABITAT MANAGEMENT FOR CONSERVATION. Species and habitats active and adaptive management is crucial to maintain biodiversity and improve ecosystem sustainability and resilience to major treats (human pressure, climate change and invasive species). The group coordinates and participates in different LIFE projects, key to promote active conservation in Europe: LIFE CHARCOS (LIFE12 NAT/PT/997, LIFE SARAMUGO (LIFE13 NAT/PT/000786) and LIFE RELICT (LIFE16NAT/PT/000754).

The Group got two national awards: "Prémio ICNF 2017 - Uma Ideia Natural" and "Fundo EDP Biodiversidade 2013". The first is related with endangered species and habitat restoration; the second is related to riverside plant diversity characterization and spatial distribution. This activities lead to the establishment of a germoplasm bank dedicated to autochthonous and rare plant species conservation.

6) The group contributed to improve the state of the art on Montado MANAGEMENT DRIVERS AND DECISION MAKING, with a special focus on the provisioning of ecosystem services and public goods (outcomes of PEGASUS and HNV-Link projects and two integrative multi-authored papers), as well as governance mechanisms and market integration challenges and options (SUFISA project, four papers in preparation).

7) The group coordinated scientific discussions on the LANDSCAPE APPROACH to the study of farming systems and of ecosystem services and public goods, having these materialized in the coordination of two Special Issues (SI) in international per-reviewed journals (some papers already on-line, closing of the SIs start 2019: "Farm and land system dynamics in the Mediterranean basin: integrating different spatial scales and management approaches", in Land Use Policy, and "Landscape and the Ecosystem Services framework: improving governance and stewardship for sustainable territorial development and resilience", in Landscape Ecology).

8) In relation to rural development mechanisms, the group has developed work within the H2020 projects SALSA and NewBie, with particular outcomes related to the analysis of REGIONAL FOOD SYSTEMS, adopting and testing a novel territorial approach to the study of the food systems (SALSA deliverables and papers under preparation). With this, a Special Issue in the journal Global Food Security has been assigned in 2018 to the coordination by researchers of the group, with conclusion expected in 2020. Researchers of the group co-ordinated the Theme 2 “Agro-Ecology and New Farming Arrangements” as well as a symposium on “Food security in local food systems”, in the IFSA (International Farming Systems Association) Conference, 1-5 July, Chania, Crete. Furthermore, a multi-actor Steering Group relating to new business models in the rural Alentejo has been settled, and within the SALSA projects, the implementation of short supply chains under the label Km0 has been developed so that the label is set in place in practice, by different actors of the regional food chain, start 2019.

ISI / SCOPUS PUBLICATIONS - 52

(Numbers referring to the complete list in Point 13)

2; 8; 9; 10; 13; 14; 15; 27; 30; 31; 36; 39; 46; 47; 53; 57; 58; 59; 60; 62; 63; 65; 68; 69; 75; 76; 87; 90; 93; 96; 99; 100; 101; 102; 103; 108; 110; 114; 115; 119; 122; 127; 128; 129; 130; 138; 139; 140; 141; 142; 143; 144.

BOOK AND BOOK CHAPTERS – 9

B1, B3, B6, B11, B14, B17, B18, B22, B23

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 26

(Numbers referring to the complete list in Point 7)

[1], [2], [4], [6]; [7]; [9]; [10]; [11]; [14]; [16]; [17]; [18]; [19]; [20]; [28]; [29]; [33]; [38]; [39]; [40]; [42]; [48]; [58]; [66]; [71]; [85]

SOIL, WATER AND CLIMATE (SWC)



HEAD OF GROUP: Ricardo Serralheiro, [ricardo@uevora.pt], Full Professor, formerly at Agricultural Engineering Department, University of Évora

INTEGRATED MEMBERS: 12

PhD STUDENTS: 1

[See List point 13 - ICAAM Members]

Keyword(s): Soil science and soil and water conservation | Climate and agricultural change | Mediterranean Irrigated agriculture | Water resources planning and management

MAJOR COMPETENCES OF THE GROUP

Soil Science and Applications, Hydrology and Water Resources Engineering, and Climate, may be enunciated as the 3 disciplines constituting the scientific domain of the Group **SWC**. These disciplines are basic to any ecological activity, as providing basic scientific knowledge to agricultural, forest, animal production, and environmental technologies. This characteristic of fundamental sciences gives the group a special position among the ICAAM groups, as the specific knowledge is required for application to almost any project in the ambitus of the institute. Therefore, the members of this group may actuate as fundamental scientists specialized in one of the 3 disciplines or they may participate as researchers in almost any project of the institute. It is detailed a little more in the next point.

MAJOR ACHIEVEMENTS IN 2018

1 SOIL SCIENCE AND SOIL RESOURCES

A fundamental concern in Soil Science, which several international organizations - as FAO, UNESCO, IUSS, ESSC – have been dealing with for decades, is the development of the World Reference Base (WRB) for Soil, concerning soil classification and soil mapping, according to the pedogenetic processes and related characteristics, which may be compared in an international basis, able to allow the migration of national soil classification systems to the WRB. Some members of the SWC group have developed work in this ambitus.

Another fundamental line of Soil Science is Soil Conservation, with Erosion studies and the development of Conservative Technologies, as Conservative Agriculture and Conservative Forestry. Most soil scientists within the group work with projects having conservative objectives and purposes.

2 HYDROLOGY AND WATER RESOURCES

Modelling climate change and water resources relationships is a research domain having the purpose of developing scientific knowledge basic to the water resources management in the conservative context of the Alentejo region, with its water resources scarcity and variable climatic conditions.

Irrigation and Drainage science and technology applies to the increasingly important irrigated agriculture in the Alentejo region. It is a world of innovative knowledge applying to a diversified set of items as crop water requirements and irrigation management, soil and water conservation with irrigation, soil salinity management, crop management with irrigation, etc.

Water use with rainfed agriculture is a special domain of Agricultural Hydrology which concerns most of the agricultural area in Alentejo, based on direct rainfall, local aquifers and surface limited sources of water. This is the most wide and general agricultural problematic, requiring cooperative research efforts of agronomists and engineers, in this and other groups of ICAAM.

3 CLIMATE

Meteorology, climate, and agricultural production. Besides the individual work with academic application, there is the participation as researchers in applied projects, in cooperation with researchers from other ICAAM groups.

Occasional droughts have always troubled agricultural production in Alentejo, but nowadays, as consequences of climate change, droughts become increasingly frequent and severe. The development of models and methods for prevision of drought occurrence and estimates of potential damages could be extremely helpful on the definition of adaptation and mitigation measures.

4 LABORATORY WORKS IN ICAAM

The laboratories are ICAAM's independent support structures for general use with the projects, not specific to any research group. The group SWC is more used to the following two labs.

4.1. Soil and Water Lab, next to the Agricultural Engineering Department

The works in this lab are directed to daily support of ICAAM's research projects, especially on soil, water, and climate.

4.2. Agronomics Lab, next to the Agronomy Department

Besides the support to research projects, this lab extends to supporting farmers with analysis of soils and agricultural products.

5 PROJECT DEVELOPMENT

- Soil and water conservation projects; projects on conservative agriculture
- Projects on olive orchards with irrigation
- Projects on vineyards with irrigation
- Projects on pastures and animal production with irrigation

6 Scientific Events

- Congresso da Água (National Water Congress)
- Invited plenary presentation, VIII Congreso Ibérico de las Ciencias del Suelo / VIII Congresso Ibérico de Ciências do Solo, Donostia-San Sebastián, 20-22 Junio 2018

ISI / SCOPUS PUBLICATIONS - 8

(Numbers referring to the complete list in Point 13)

5; 6; 12; 104; 116; 117; 120; 121.

BOOK AND BOOK CHAPTERS – 2

B13; B15

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 5

(Numbers referring to the complete list in Point 7)

[12], [21], [43], [44]; [59]

FARMING TECHNOLOGY AND ENERGY EFFICIENCY (FTE)



HEAD OF GROUP: José Oliveira Peça, [jmop@uevora.pt], Associate Professor at Agricultural Engineering Department, University of Évora

INTEGRATED MEMBERS: 13

PhD STUDENTS: 1

[See List point 13 - ICAAM Members]

Keyword(s) | Development of farm machinery | Precision agriculture and PLF | Energy efficiency in agro-production and industry | Material and energetic use of biomass

MAJOR COMPETENCES OF THE GROUP

- 1) Development of farm machinery is dedicated to the concept, design, construction and field testing for prototype validation of equipment for managing practical problems affecting strategic Mediterranean crops. Projects are being pursued in olive harvesting and mechanical tree pruning (olive, pear and apple trees).
- 2) Precision agriculture and remote sensing is targeting state-of-the-art knowledge in GIS and precision agriculture and remote sensing towards applications on economically important agricultural, livestock and forestry activities: Proximal sensor technology to manage the productivity and quality of grapes, enhancing economic and environmental sustainability of the wine production sector and real time adjustment of environmental conditions of housing for animal welfare; European Space Agency remote sensors (2nd generation MSG satellites) to monitor and riskmapping for pests and diseases (National risk mapping for the tomato pest, *Tuta absoluta*); satellite allometric functions for biomass estimation and mapping of Mediterranean forest species (*Q. rotundifolia*), creating a model to estimate above ground forest biomass based on tree crown horizontal projection obtained using high spatial resolution satellite images.
- 3) Energy efficiency and waste management identifies, quantifies and corrects measures to questions related to the energy used in relevant agriculture sectors: wineries, olive oil mills, animal feed factories, and fruit and vegetables processing facilities, and develops practices of circular economy in the agro-food sector.
- 4) Process engineering develops the concept of biorefinery with the upgrade of all elements that exist in the lignocellulosic biomass, major polymers: hemicellulose, cellulose and lignin, and minor components: extractives, tannins, proteins, etc., to obtain a set of products that may be tradable. The Group contributes to the value chain and agro-ecosystem thematic lines.

As a resume the domains of specialization of the group are:

- Satellite functions for biomass estimation and mapping
- Sensors based techniques to monitor production, plagues and diseases
- Precision Agriculture
- Energy efficiency in agriculture and animal production
- Process Engineering
- Mechanization of tree pruning and fruit harvesting
- Livestock Precision Farming

- Circular Economy

MAJOR ACHIEVEMENTS IN 2018 OF THE GROUP

- 1) European Patent granted for the Side-Row Continuous Canopy Shaking Harvester;
- 2) Participation by invitation for the display of the Side-Row Continuous Canopy Shaking Harvester during the World Olive Oil Summit 2018 (WOOS), CNEMA, Santarém;
- 3) The project SPARKLE won the Award AgroIN <http://www.vidarural.pt/agroin/>;
- 4) Professor Fátima Baptista elected President of the European Society of Agricultural Engineers (EurAgEng) for the biennium 2020-2022;
- 5) Award for the poster "Wines that think" in the III National Symposium of Horticultural engineering and I Iberian Symposium "use of drones and satellite images in agriculture";
- 6) The Committee of the Iberian Conference of Agro-Engineering, Instituto Politécnico de Bragança attributed 1st prize-BEST PAPER PRESENTED AT THE CONGRESS to the work "assessment of technology in monitoring the effect of trees on the productivity and in the quality of the pasture";
- 7) The Scientific Committee of the "III National Symposium and I Iberian Symposium of Horticultural Engineering" (SNIH2018-Agricultural Use of Drones and Satellites ", attributed to work " NDVI as an indicator of quality degradation of pastures: tool to support Decision-making " the First Prize – BEST ORAL COMMUNICATION;
- 8) Organization of the II Workshop Project MechSmart Forages "Mechanization and ISOBUS". Agrarian Superior School of Elvas/Herdade da Comenda, Elvas, June 15th;
- 9) AWARTECH Project – Selected for presentation by invitation in the Sessions on New Applications for Agriculture-National Rural Network, under the launch of the fifth edition of the award Entrepreneurship and Innovation of Agricultural Credit) that took place at OviBeja and the National Agricultural Fair 2018.

ISI / SCOPUS PUBLICATIONS - 15

(Numbers referring to the complete list in Point 13)

7; 11; 33; 34; 48; 78; 79; 89; 94; 98; 119; 120; 121; 125; 126.

BOOK AND BOOK CHAPTERS – 1

B11

RESEARCH PROJECTS COORDINATED BY A MEMBER OF THE GROUP - 13

(Numbers referring to the complete list in Point 7)

[3], [5], [13], [15]; [25]; [41]; [45]; [46]; [49]; [56]; [57]; [61]; [73]

THEMATIC LINES STRATEGY AND RESULTS 2018

OLIVE GROVES E OLIVE OIL

Boost quality and notoriety of olive groves and olive oil production mainly from Portuguese olive varieties, increasing competitiveness of the sector

Coordination: António Bento Dias and Raquel Garcia

GOALS - The main goal is to enhance sustainability of olive groves and olive oil production, mainly from Portuguese olive varieties. The rapid growth of olives in Alentejo was based in imported varieties with different organoleptic characteristics of the Portuguese ones. To preserve the specificity of Portuguese varieties, there is an urgent need to overcome the difficulties associated to their use in intensive production.

PROBLEMS

For olive groves are: lack of quality of plant material; phytosanitary limitations of these varieties; lack of knowledge of production techniques more suitable for these varieties. **RESEARCH QUESTIONS:** 1) selection, genetic improvement and propagation of these varieties; 2) evaluation of varietal behavior to optimize end-product production; 3) biology of key pests and diseases, developing alternative methods to chemical fight and evaluation of functional diversity of the ecosystem; 4) integrating irrigation and fertigation to minimize environmental impact; 5) adequate olive canopy to continuous canopy shaking harvesting; 6) development of techniques and technologies for the use of by-products of olive groves.

For olive oils, PROBLEMS are: quality certification, guaranty of its authenticity and geographical and varietal traceability and genuineness (in terms of adulterations). Some drawbacks related to mill wastes could be also appointed.

RESEARCH QUESTIONS: 1) metabolomic studies involving “profiling” and “fingerprinting” approaches of Portuguese olive oil varieties; 2) assessment of food safety in terms of pesticide residues and other contaminants; 3) treatment and recovery of mill wastes promoting their valorization by the use of value-add olive products; 4) evaluation of sensory perception by consumers. Sustainability of Portuguese olive oil sector constitutes a key factor for its competitiveness.

MAIN ACHIEVEMENTS IN 2018:

1 - I) The UPOV morphological characterization of two olive cultivars, Cordovil de Serpa’ and ‘Verdeal Alentejana’, used in Alentejo DOP’s, was done;
II) Explants of 7 olive cultivars from the Alentejo region were established on “in vitro” culture;
III) A new non-destructive technique for monitorization of rooting efficiency of olive cultivars was developed, which integrates the knowledge of Calorespirometric Parameters and Near Infrared Spectroscopy (FT-NIR);
IV) A new methodology correlating fat evolution in dry matter and ripening index is being developed to access a simple technique aiming to determinate the ideal harvesting moment.

2 - I) Advances on olive pests and diseases biology and population genetic structure and diversity- Pests: Diversity and genetic structure of *Bactrocera oleae* and *Prays oleae* populations in Portuguese olive groves; Diseases: Diversity and structure of populations of *Colletotrichum* spp. and knowledge about the biology of the disease in the olive tree, namely of its forms of plant infection; Knowledge and evaluation about the presence of *Xylella fastidiosa* insect vectors - associated to the olive quick decline syndrome - in the olive grove ecosystem, and formulation of risk maps associated with the potential risk of olive trees infection by the bacteria;

II) Knowledge advances about the negative impact associated with the use of chemical control for key pest control- Pests: Evaluation about the resistance levels on *B. oleae* in Portugal and Spain olive groves, to the main insecticide - dimethoate – applied against olive fly;

III) Knowledge on non-chemical control methods alternatives to chemical control to be used on olive integrated pest management: Biological control - Knowledge about the diversity and population structure of predators and parasitoids associated to the functional arthropod fauna of the olive grove ecosystem, with potential for olive key pests control; Knowledge about the presence and diversity associated to endophytic fungi on olive canopy, with potential antagonistic action against *Colletotrichum* sp;

IV) New technique for simultaneous detection of several olive virus based on real time PCR (qPCR) was successfully developed;

V) Two AMPs (Antimicrobial peptides) vectors were developed Aiming on protect olive plants against *Colletotrichum* and *Xylella*. Those vectors are now ready to be tested on contaminated plants and its protection by European Patent is ongoing.

3 - New important information on olive orchard management techniques, tree productivity and olive oil quality, was achieved.

4 - Preliminary field test for the development of an integrated solution of pruning and harvesting system to the Portuguese varieties;

5 - Analytical tools to ascertain geographic origin of olive oils has been developed; Chemical characterization of varietal olive oils from main cultivars was achieved.

6 - Development and validation of a new analytical tool for the identification and quantification of minor phenolic compounds in olive oil

7 - Contribution to the study of the olive grove and the olive oil sector from a territorial, socio-ecological and spatial perspective, aiming the creation of instruments of political management that increase the sustainability to the sector

8 - Advanced selective sample preparation methodologies for the trace analysis of pesticide residues in olive oil samples were achieved.

9 - Characterization of eating habits (study done in the population of the North Alentejo), regarding the consumption of olive oil and olives; Relationship between the consumption of olive oil and the sensorial characteristics of consumers (taste sensitivity and protein composition of saliva).

VITICULTURE AND ENOLOGY

Optimize management strategies to improve the efficiency and productivity of Alentejo vineyard and enhancing wine quality, addressing the plant and its environment (soil and climate), the wine and the technology and the market and consumption

Coordination: Maria João Cabrita

GOALS: The region of Alentejo has excellent environmental conditions for growing grapes but its productivity needs to be improved and several PROBLEMS need to be solved. In the past, chemical fumigants were used by farmers for pathogens control (nematodes, fungus, and bacteria), but sharp restrictions in the use of chemical formulations worldwide have been established due to their high toxicity for man and environment. Environmental issues and societal awareness are in parallel with a resurgence of phytosanitary problems in Portugal characterized by a decline of grapevine in the vineyards. Hence, there is urgent need for sustainable management strategies and control of some pathologies associated to the vines. The impact of vitivinicultural production on the environment must be reduced, and for this attention must be paid to the effectiveness and implications of innovative technologies related to wine production and to water and energy efficiency.

RESEARCH QUESTIONS: 1) how to increase plant resilience to biotic or abiotic stress; how to increase the productivity (quantity and/or quality) of vines, maintaining the sustainability of the production including soil conservation; 2) how to improve quality and added value of products (table grapes, wines, spirits), taking

advantages of the differentiation provided by Portuguese varieties and new technologies;3) how to optimize energy and water consumption, wastes and by-products management and valorise them economically;4) how to increase resources use efficiency and reduce production costs;5) how to improve environmental and social sustainability of the vitivinicultural sector.

MAIN ACHIEVEMENTS IN 2018:

- 1) regarding the complex disease associated with decline of grapevine in Portugal the establishment of a nematode research led to identify and establish the complex species of longidorid nematodes associated with this disease
- 2) regarding the establishment of sustainable management strategies and control methods against these pathogens, a new sustainable management strategies and control against them, involving mycorrhizae and developer plants is being developed and also the vineyards biodiversity and the potential of birds and bats for pest biological control is being implemented.
- 3) To increase knowledge on varietal wines and the impact of news technologies on its quality, a research study is focusing on the impact of agronomic practices and enological additives on wine quality and an analytical methodology to assess mineral content of wines was established (some results already published)
- 4) Regarding development of tools to ensure authenticity of wine products, new technologies to ensure the sustainability of the ageing process, differentiation and quality of wine spirits are ongoing with already some results published; a new analytical tool based on stable isotopes is being used to assess geographical origin of wines and a fully chemical characterization of Amphora wines was obtained and published
- 5) the optimization of waste and by-products management throught Circular Economy Practices is being implemented.

ANIMAL PRODUCTION AND HEALTH

Optimize animal production by the rational use of natural resources, the adaptation of species/breeds to a changing environment and production systems, taking in account both animal and human health, and food quality and safety

Coordination: Rui Charneca and Ricardo Romão

GOALS:

Extensive Animal Production

PROBLEMS: difficulties on animal feeding, animal welfare, health and resilience in a changing environment, reproductive efficiency, products characterization and protection

RESEARCH QUESTIONS: 1) how to optimize the use of plant resources for animal nutrition, e.g. use new/modern technologies to know nutritional values of plants, knowing the feeding behavior of animals in the field, knowing the needs of species/breeds in several physiological phases and in the Mediterranean climate conditions; 2) how to use genetic knowledge and tools to support animal adaptation and productivity, e.g. use the knowledge of genes related to climate adaptation and resilience in selection programs of breeds; use of “new genotypes”; 3) how to adapt and optimize assisted reproduction techniques to extensive production, e.g. use of adapted protocols considering differences in physiology and/or production environment; 4) how to monitor and control animal health considering that it also has impact on human health (One health concept), e.g. test the use of alternatives to conventional drugs to control parasitic, bacterial diseases; 5) how these changes can influence the animal products quality also addressing the use of technological, genetic, chemical and biochemical tools for the food products valorization (quality and safety).

Intensive Production Systems

RESEARCH QUESTIONS: 1) how to improve the adaptation of “intensive type” genotypes to the environmental Mediterranean conditions, e.g. studying new facilities and or management practices that allow high productivity in a more extreme environment; 2) how to manage the production, composition and storage of produced liquid and solid residues in the perspective of their valorization?, e.g. studies on the impact of feeding management in the production and composition of the residues; studies on treatment and/or storage methods that conduct to a better use of the animal production residues).

MAIN ACHIEVEMENTS IN 2018:

1 - new knowledge on biomass production and its nutritional value in addition to increasing information on animals’ needs – new nutritional programs

Publications on the use of technologies (NIRS) to determine the nutritional value of pasture and acorns for pigs, on the grazing behavior of ewes, on influence of salivary proteomics on the ingestive behavior and on the effects of diet on performance and meat quality of lambs and in pigs. Three ongoing projects in 2018 with potential contribution to this point, one with beef cattle, one with goats and one with small ruminants

2 - new classical and omics genetics tools to improve animal productivity, health, welfare, resilience of autochthonous and exotic genotypes

Publications on a new pig cross between two Portuguese local breeds and on the allelic variation in polymorphisms located in candidate genes of Alentejano pig breed. Five ongoing projects in 2018 with potential contribution to this point, one with beef cattle, one with dairy cattle, one with ovine and 2 with pigs.

3 - increased fertility and/or prolificacy of herds due to the use of improved nutritional strategies and current use of assisted reproductive techniques

No direct publications in 2018 but 3 ongoing projects (2 of them demonstration and knowledge transfer projects) with focus on this topic (1 in beef cattle, one with horses and 1 focus on large and small ruminants)

4 - new tools to control animal health concomitantly with the reduction of antimicrobials

Publications on ovine mastitis and on effects of natural antimicrobials effects on *Staphylococcus* spp and on footrot in sheep. Seven ongoing projects focus on small ruminants, horses, dairy cow, bees and one in the One-health concept.

5 - new tools to control or modify animal products in order to improve their quality, traceability and safety and to valorise the differentiating characteristics of the Montado

Publications on cheese making and cheese valorisation. Five ongoing projects focus on cheese technology, ovine meat, beef cattle meat and cured pig products.

AGRO-SILVO PASTORAL SYSTEMS – MONTADO

Optimize sustainability and support adaptive management of the Montado, by combining its different components and integrating ecosystem services, products' added value, landscape multifunctionality, and better informed public policies, ultimately reducing the loss in tree canopy density and total area

Coordination: Teresa Pinto Correia and Carlos Godinho

GOALS: Agro-silvo-pastoral systems are particular as composed by three main interacting components: forest, pastures and livestock. Different management strategies consider differently this interaction producing distinct results in the system's balance, in particular in the ecosystem services provided. Products can contribute by increasing added value. The goal of this program is to contribute to optimize the management of the system, acknowledging the spatial variability at plot and landscape scale and creating adapted monitoring tools to make it possible to deal with the strong variability across space and time.

The **PROBLEMS with the forest** layer are the decay of tree canopy and too low tree recruitment. The most urgent **RESEARCH QUESTIONS** are: 1) how to increase the primary production of oaks and 2) how to better adapt the forest to climate change.

The **PROBLEMS with pastures** are poor growth and poor nutritional value. The most relevant **RESEARCH QUESTIONS** are: 1) which chemical approaches can improve plant growth and nutritional value; 2) which beneficial soil microbes can be used and how; 3) what is the effect of plant pathogens and pests.

The **PROBLEMS of livestock** productivity are in the dedicated Thematic Line.

The **PROBLEM with products** is low level of market differentiation. There is one overall **RESEARCH QUESTION** which is 1) how to improve the quality of the products so that also their added value is improved.

The management **PROBLEM** is that focusing on one or other component often leads to unbalances in the system. In order to contribute to more informed management, the overarching **RESEARCH QUESTIONS** that need firstly to be solved are: 1) how do different management models perform in terms of the economic, social and environmental performance; 2) how to better inform managers of best adapted practices to their Montado; 3) how to measure and incorporate ecosystem services and public goods into management.

Spatial variability is an underlying condition of the Montado, which also contributes to its richness in terms of biodiversity, landscape and a diversity of public goods. Nevertheless, it results in a difficulty in terms of connecting research outputs to practice. Evidence produced in one specific Montado context can most often not be generalised to other contexts. The most striking **PROBLEM** here is the difficulty in producing all the needed context specific knowledge and progress through flexible science-practice interfaces, as well as the lack of flexibility in the public policy intervention, to cope with this differentiation. The **RESEARCH QUESTIONS** are: 1) how to more exactly identify the Montado differentiation and classify in a consistent way, the different Montado contexts, 2) how to multiply empirical assessments and adapt the knowledge produced to different Montados, 3) how to monitor efficiently the activities and consequent changes in order to support adaptive management, 4) how to integrate different management levels and goals, 5) how to create policy tools adapted to the existing differentiation in the Montado. Co-construction with landowners is essential in this program, for defining adaptive management models.

MAIN ACHIEVEMENTS IN 2018:

1) New knowledge on the system functioning as a socio-ecological system, including its different components (one multi-authored paper published) and in particular, the relationship between management and the public goods provided by the system (three integrative multi-authored papers published), as well as the

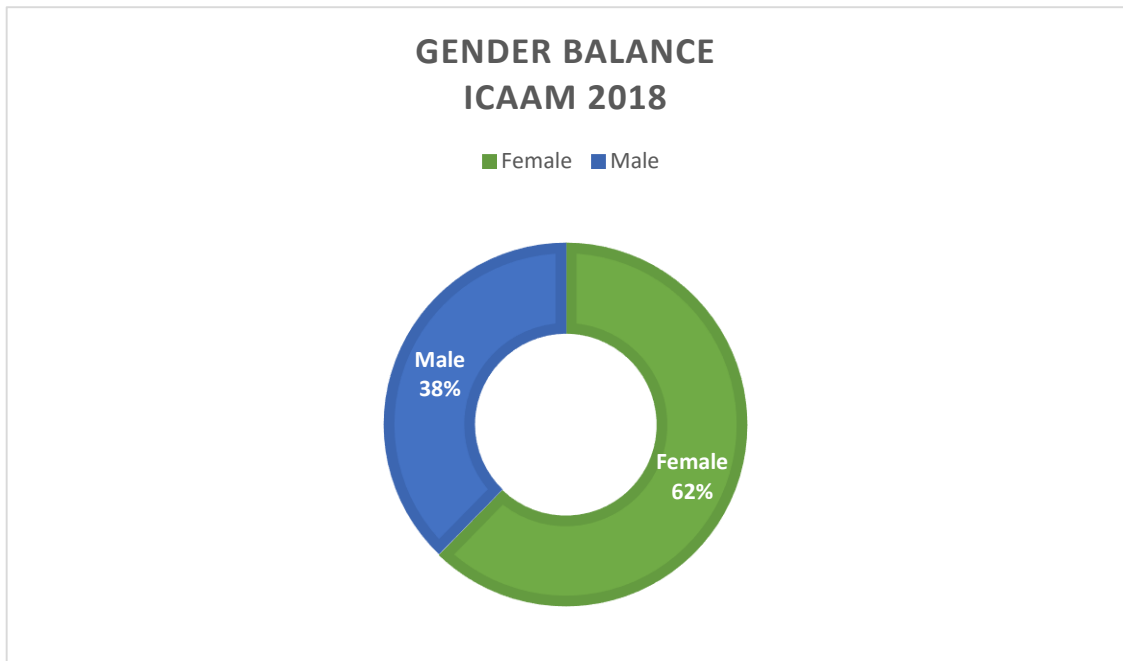
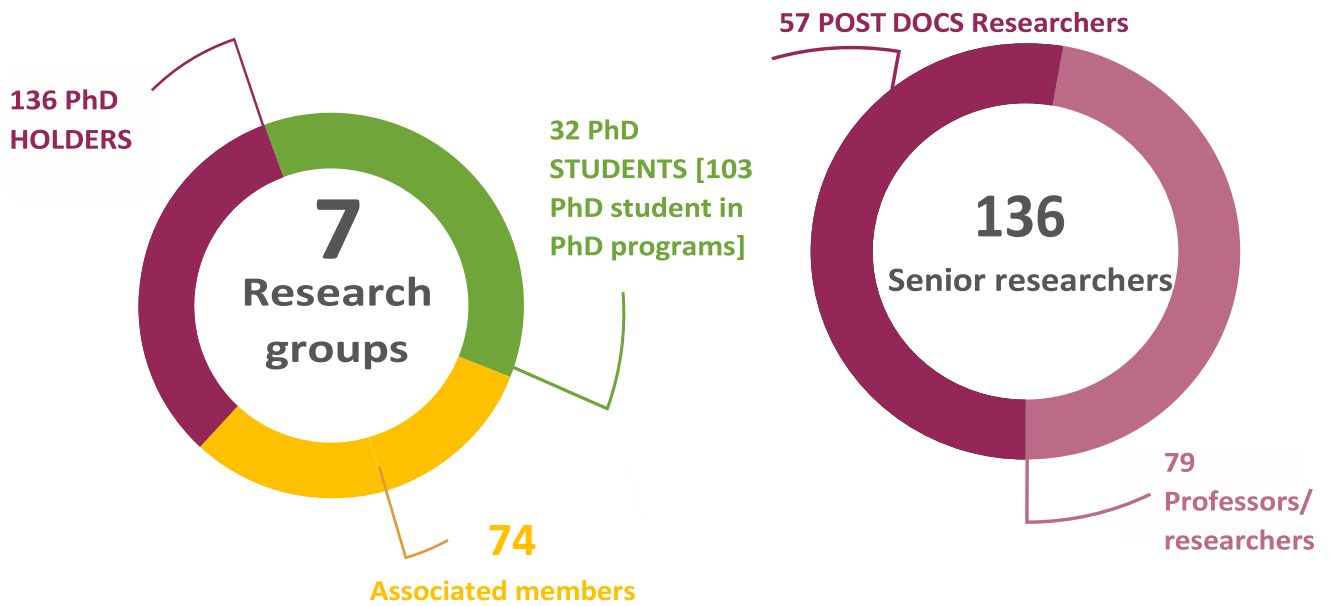
governance of the system and forms of market integration adopted by Montado land owners (SUFISA project; four papers under preparation).

2) Progress in the development of monitoring tools combining remote sensing with field information, to support data collection in the Montado and precision management (Eco-SPAA project; three papers published).

3) Deepening of science-practice and science-policy interface, with multiple participated methods applied in different moments in research projects (PEGASUS, SUFISA, GO InovMontado), regularly in the Tertúlias do Montado, and in the co-organization of the 2nd Conference on the Flora and Fauna of the Montados- a Multifuncional Approach (Grândola).

4) Co-construction of a pilot scheme for result based agri-environmental measures (as part of the post 2020 Common Agricultural Policy) in the Montado, with several working sessions, a learning visit of researchers, administration staff and farmers, to the Burren, in Ireland, to learn about Result Based Payments, and a dedicated workshop in the Feira do Montado, Portel, December 2018.

4. ICAAM PEOPLE 2018



5. NETWORKING

The ICAAM aims to be at the forefront of international research while being actively involved in discussions on strategies for research in the field of environmental sustainability, food production and territorial cohesion. The involvement of researchers in many international projects and networks strongly contributes to this. Internationalization is supported by core funding covering participation in international networks, scientific meetings, preparatory meetings for projects submission to competitive funding, and by inviting international colleagues for research stays in ICAAM.

ICAAM is involved in 36 international projects, 10 being H2020 projects: 1 coordinated by the Unit. Individual researchers are members of international organizations and panels, two in Presidential positions. The Unit is a member of international networks such as EURAGRI (European Agricultural Research Initiative). Since 2017 the Unit hosts a Delegation of UNIMED: Union of Mediterranean Universities, with 103 Universities in the Mediterranean Basin, for knowledge and training exchange. This delegation coordinates a UNIMED Sub-Network on Food and Water, to foster contacts and collaborations focused on the PRIMA program

UNIMED AND THE SUB-NETWORK ON FOOD AND WATER

The subnetwork “Food & Water” was created to address challenges of the Mediterranean region with a focus on agricultural systems and their resilience in the context of issues such as climate change and water management, as well as bio-energy, territorial integration and agro-industrial value chains. Coordinated by ICAAM-University of Évora the subnetwork initially composed by 20 partners from 9 countries in 2017, has grown to 28 partners from 12 countries at the end of 2018. The objective of the subnetwork is to bring together research centers, university departments, faculties, academics and researchers that work in this fields, in order to favour scientific cooperation, the exchange of experiences and information, the strengthening of existing partnerships and the establishment of new collaborations.



UNIVERSIDADE
DE ÉVORA

In 2018, the major achievements of the subnetwork office was the creation of a network of contacts between institutions and researchers on both sides of the Mediterranean that allowed to collaborate and more specifically led to the creation of consortia to participate in various calls to European programs.

An application for the Erasmus + KA2 Capacity Building program has been prepared and submitted in February 2018 with two other European partners – University of Sassari (Italy) and UNIMED (Italy) – and 4 Egyptian partners, project “MedFOOD – Mediterranean cooperation and capacity building on Food Processing for Egyptian Universities” led by Marta Laranjo, ICAAM-UEVORA researcher. Unfortunately, the proposal was not selected for funding, but was evaluated in group II – applications of good quality. In October 2018, a new application began to be prepared for the Call for proposals 2019 of the Erasmus + KA2 Capacity Building program, which was submitted in February 2019, project “FoSAMed – Capacity building on Food Safety for the Mediterranean”. The project, led by the University of Évora, has two other European partners – University of Barcelona (Spain) and UNIMED (Italy) and four Moroccan institutions and aims to promote the implementation of a joint Master Program for Moroccan universities, in the field of Food Safety.

The subnetwork office submitted and supported some applications for PRIMA (Partnership for Research and Innovation in the Mediterranean Area) with several subnetwork countries institutions in the 2018 call and helping to prepare new applications in the 2019 call.

The subnetwork was involved also in a new application for the Erasmus + Mobility (KA107- 574F0D81-EN) witch by our suggestion were added to the proposal the Institut Agronomique et Vétérinaire Hassan II from Rabat (Morocco) and the University of Béjaia, Université Kasdi Merbah Ouargla, Université Frères Mentouri Constantine and Université de Sétif from Algeria.

On 15 October 2018, the UNIMED Office promoted the seminar *Securité Alimentaire et Gestion de la Nouvelle Ville en Méditerranée*, at the IAV - Institut Agronomique et Vétérinaire Hassan II, in Rabat, Morocco. The mission also included a visit to the FOO - Fondation Orient- Occident (<http://www.orient-occident.org>), in Rabat. This mission was fundamental for the exchange of experiences, discussion of common research fields, definition of priority areas for cooperation and establishment of pre-agreements for future applications. On this occasion, it was possible to ascertain the needs of IAV and ENA - Ecole Nationale Agriculture of Meknès, also present on the seminar, and define the basic lines of collaboration in the commom research areas between ICAAM and IAV/ENA.

Meanwhile, through this first approach contacts were also made with other Moroccan universities (The Faculty of Sciences of the University Ibn Tofail Kenitra, University Mohammed Premier, etc. and with Algerians universities: the University Djilali Bounaama of Khemis Miliana, Kasdi Merbah University Ouargla and Université Sétif to develop new collaborations).

The office promoted a cycle of conferences designated “Dynamics of the Mediterranean” that aims to foster partnerships, transfer scientific knowledge, promote activities and projects and make known the research done at the University of Évora and partners. The sessions last half a day, with 4 to 5 communications /interventions by researchers or specialists followed by a period of discussion. During the year 2018, three sessions were held: on February 28, on May 23 and on November 28. The last one was dedicated to the theme Water in the South and in the Mediterranean region: the challenges of sustainability.

The subnetwork was present in the UNIMED General Assembly of 2018, represented by Prof. Gottlieb Basch, President of the Subnetwork. In November we applied for the organization of the “2019 UNIMED GENERAL ASSEMBLY” to be held at University of Évora.

Despite being well received the final decision turned out to be unfavourable as the board intends to change between the shores of the Mediterranean, and the last was in Venice so the decision went to Beirut (Lebanon).

OTHER INSTITUTIONAL NETWORKS

- UNIMED: União das Universidades do Mediterrâneo (<http://www.uni-med.net/>)
- EURAGRI: European Agricultural Research Initiative (<https://www.euragri.aau.dk/>)
- Global Network on Silvopastoral Systems (<https://globalsilvopastoralnetwork.org/>)
- Rede ECOGRAM (Programa Cyted) - Red Iberoamericana para la Mejora Productiva de Sistemas Silvopastorales Mediante la Utilización de Sistemas Ciberfísicos
- FABRE- TP: Farm Animal Breeding and Reproduction Technology Platform (<http://www.fabretp.eu>)
- Agribenchmark - The Beef and Sheep Network (<http://www.agribenchmark.org/>)
- RIBOLIVA: Red Iberoamericana de Olivar y Aceites de Oliva (<http://www.riboliva.com>)
- INDEHESA: Instituto Universitario de Investigación de la Dehesa (<http://indehesa.unex.es/>)
- ERBF COST CA16224
- ESF-EURAPMON
- IENE Infra Eco Network in Europe.

NETWORKING ACTIVITIES

EURAGRI - European Agricultural Research Initiative |

EURAGRI



- Participation in Euragri meeting in Oslo 24-25.9.2018 (the presentations delivered at the meeting are available by request)
- Participation in the GA hold during this meeting, in the quality of full member of EURAGRI
- Organization of events-WS in Brussels in June about "Multifunctionality" and Plenary Meeting in September in Ghent with the theme "Agriculture, food, forest, fisheries – the bio-economy doing research for society"
- Document made by EURAGRI for a conference "Austrian EU Presidency Conference"

GLOBAL NETWORK ON SILVOPASTORAL SYSTEMS |



The Global Network on Silvopastoral Systems is a multi-stakeholder partnership with the common aim of strengthening and scaling up of silvopastoral systems worldwide, specifically through the generation, exchange and dissemination of knowledge, the documentation of public policies and the facilitation of dialogue to address the challenges associated with sustainable development goals. The network includes 29 countries and ICAAM participate through exchanging knowledge, best practices, and experiences related with the integration of livestock with trees, soil and pasture in the Montado.

in September 2018 ICAAM had a meeting in Argentina with Pablo Péri, the Director of the network, to pass the experience obtained from the I World Congress in Silvopastoral Systems, and to plan the II World Congress in Silvopastoral Systems, to will be held in 2020, in Argentina.

REDE ECOGRAM (PROGRAMA CYTED) - Red Iberoamericana para la Mejora Productiva de Sistemas Silvopastorales Mediante la Utilización de Sistemas Ciberfísicos



EcoGram is a CYTED network of 11 countries concerned with innovating management practices of silvopastoral systems and extensive livestock farming based on Information and Communications Technologies, namely a mobile app where the received images will be analyzed to link them to biophysical variables. We had a second general meeting to discuss and define the variables to use, and to train the use of the

website. The app for smartphones produced by ICAAM “Pastor.i” was presented. A follow-up meeting was made in Évora to present the ICAAM’s experience with GPS tracking collars and to discuss the possibility of having a tailor-made GPS for Montados and Dehesas.

FABRE – TP: FARM ANIMAL BREEDING AND REPRODUCTION TECHNOLOGY PLATFORM |



We’ve participated in the General Assembly and annual meeting of FABRE-TP in 2018. The main discussion points were: the next European program for research projects and the efforts to have animal breeding lines in the calls, the communication with society and the building of project consortiums with private enterprises. We had the opportunity to express our interest and explain the potential advantages of include in the consortiums also smaller research institutes like ICAAM. The General Secretary of FABRE-TP show the interest of having the annual meeting (and GA) in Évora in 2020, which I consider an excellent opportunity to show our capacities and skills to the other platform partners.

AGRIBENCHMARK - THE BEEF AND SHEEP NETWORK |



Since 2018, Portugal, through ICAAM, is part of the agri benchmark network – beef and sheep, which is a global network of agricultural economists, technicians, producers and other specialists in key sectors of agricultural value chains. This network uses internationally standardized methods to analyze farms, production systems and yields. Farm-level knowledge is complemented by the analysis of the international markets for agricultural goods and value chains, with the aim of giving decision-makers in policy, agriculture and agribusiness scientifically sound answers on strategic issues.

We participated by the first time on the Beef and Sheep Conference in 2018 (Ireland, June 2018) with a presentation of the beef and sheep situation in Portugal: farming systems and structural issues, production, consumption, trade, supply chains and challenges and opportunities.

RIBOLIVA NETWORKING |



During 2018, the activities of Riboliva networking has been mainly focused on the organization of a Workshop (“II Workshop Internacional sobre cocina saludable”- January, 2018), training courses (“Título de Experto Interuniversitario: Olivicultura, Elaiotécnica y Marketing de Aceites de Oliva”- January 2018 and “II Curso de Formación ‘Elaboración, análisis sensorial y aspectos saludables de los Aceites de Oliva Vírgenes”- October 2018) and also an international conference (III International Congress on Virgin Olive Oil, Olive Grove and Health- May 2018).

6. EDUCATION

The ICAAM participates, as an associated research centre, in the following PhD programs, in which are enrolled 111 students.

- Agricultural and Environmental Sciences [course in association]
- Biochemistry
- Biology
- Food Sciences [course in association]
- Veterinary Sciences
- Interdisciplinary Landscape Management

In 2018, the number of registered students for each PhD Programme was the following:

PhD Programme	PhD students in 2018
PhD Programme in Agricultural and Environmental Sciences	35
PhD Programme in Biochemistry	16
PhD Programme in Biology	22
PhD Programme in Food Sciences	13
PhD Programme in Veterinary Sciences	13
PhD Programme in Interdisciplinary Landscape Management PhD	12
TOTAL	111

9 PHD Students presented the PhD thesis in 2018

PhD Programme	Student	Conclusion
Biochemistry	Patrícia Alexandra Anico Gazimba Bacalhau	30/01/2018
Biology	Maria Margarida Saial Santos Guiomar Espada	22/03/2018
Biology	José Rodrigo da Silva	23/03/2018
Agricultural and ES	Edvanda Silva Rocha Reis	03/04/2018
Biology	Elsa Margarida Lourenço Almeida	06/04/2018
Biology	Carlos Manuel Gaspar dos Reis	20/04/2018
Agricultural and ES	Igor Alexandre da Silva Dias	26/07/2018
Biology	Tadeu José Faria de Sousa Pereira	30/07/2018
Agricultural and ES	Madalena Pirata	12/11/2018

7. SCIENCE & SOCIETY

ICAAM is actively involved in bringing its research and researchers closer to society. This is done through communicating our scientific breakthroughs through media, website and social networks, organizing outreach activities, such as visits from high schools and universities and science displays.

KNOWLEDGE TRANSFER was a research associated activity in ICAAM. The seminars "Investigar ICAAM" took place every two months for communication of science to external colleagues and stakeholders, with broad participation. In 2018, 3 technical videos were produced and disseminated. They focus on Conservation Agriculture and Pasture Improvement, and aim to educate on sustainable soil management.

During 2018 ICAAM has organized 5 sessions of the "Tertulias do Montado", a regular and structured dialogue between the different actors linked to the Montado, to strengthen linkages and discuss pathways for the increased sustainability of this system.

Further LINKING SCIENCE TO SOCIETY, researchers were invited and actively involved in the preparation of the Regional Smart Specialisation Strategy promoted by CCDRA, in the "FECA - Forum para a Economia Circular do Alentejo" initiated in CCDR in the sequence of the success of "Alentejo Circular" project, in the Experts group for the definition of the FCT Strategic Agenda for I&I in Food, Agriculture, Forest and Biodiversity, and in consultancy panels of the Ministry of Agriculture (Expert Group on the CAP post 2020) and of the Ministry of Environment.

Several initiatives connected to schools, as Open Days, the project "I am a Scientist", "Ciência Viva" and many school visits to ICAAM laboratories.

ICAAM was present in Encontro Ciência 2018 and Montado fairs, where dissemination materials about research were distributed and several activities for schools and for the general public were carried out.

MEDIA AND SOCIAL MEDIA

The "Office for Communication, Technology Transfer and Innovation" (UDIT) from ICAAM maintains an active communication with the outside world through its website, social media networks and press releases. ICAAM maintains active accounts on Facebook, Twitter, YouTube, Instagram and LinkedIn.

The website (www.icaam.uevora.pt; 39251 views), Facebook (with 1200 followers), the media and specific public (LinkedIn 1500 connections; Twitter 1600 tweets and 200 followers). A trimestral newsletter was distributed internally and a Bulletin to communicate the activities to the community.

In 2018, we produced 79 news for the website and had approximately 50 mentions in national and international media.



8. A YEAR IN REVIEW

JANUARY**JULY****DECEMBER****JAN**

2nd Jan - ICAAM **Videos Launch**

Video 1 - Aromatic and Medicinal Plants: The essential oils and the food - <https://vimeo.com/232708341>

Video 2 - In vitro plant propagation. - <https://vimeo.com/232990471>

FEV

14th FEV- **Research ICAAM** - EUROPE-AFRICA COOPERATION [INVESTIGAR ICAAM - A COOPERAÇÃO EUROPA-ÁFRICA]

23th FEV - **Meeting** About Partnerships to combat the Nematode

23th FEV - **Award** for the poster "Wines that think" in the III National Symposium of Horticultural Engineering and I Iberian Symposium "use of drones and satellite images in agriculture"

**MARCH**

3-4th MAR - **Award for Best Poster** at the Working Days/Conference of HOSPITAL VETERINÁRIO DA MURALHA attributed to the PhD student Nara and to Professor Cristina Queiroga

APRIL

Brand I&D Award (AGROIN Vida Rural) attributed to the project Sparkle - Sustainable Precision Agriculture coordinated in the ICAAM Research Centre by Professor José Rafael Marques da Silva. Sparkle is an international project which brings together universities, businesses and farmers in order to prepare agricultural entrepreneurs with a focus on precision agriculture and sustainable practices.



MAY

3-4th MAY – **Agronomy Working Days**

Vegetables Cycle Training 2018 (10 sessions)

16-18th MAY - Training in **Health maintenance of the Montado**.

AWARTECH Project – Selected for presentation by invitation in the Sessions on New Applications for Agriculture-National Rural Network, that took place at OviBeja and the National Agricultural Fair 2018



JUN

European Patent granted for the Side-Row Continuous Canopy Shaking Harvester for Universidade de Évora.

7-8th Jun- **Presentation of the prototype** of the MCCA (Side-Row Continuous Canopy Shaking Harvester) in World Olive Oil Summit 2018 (WOOS), integrated into National Agriculture Fair (FNA18).

7th JUNE - **HNV-Link Cross-Visit to The Burren**, Ireland

15th JUNE – Co-Organization of the II Workshop Project MechSmart Forages "Mechanization and ISOBUS". Agrarian Superior School of Elvas/Herdade da Comenda, Elvas, June 15th



JULY

Scientific Occupation in School Holidays "Ciência Viva". Realization of 3 scientific trainees, inserted in the initiative Ciência Viva in the Laboratory.

8-12th JUL- **Participation** on the AgEng2018 Conference, Wageningen, Holland. Professor Fátima Baptista was confirmed as the next President of the European Society of Agricultural Engineers (EurAgEng) for the biennium 2020-2022. AgEng2020 will be held in University of Évora between 5 and 9 July.



SEPT

3th SEPT - **Official release of the book** “European Landscapes in Transition-Implications For Policy And Practice”, by Prof. Teresa Pinto Correia, Clermont Ferrand/France

2-6th SEPT - The Scientific Committee of the 10th International Symposium on the Nutrition of Herbivores (ISNH2018), Clermont-Ferrand, France, attributed to the work "Can digital camera images provide useful information for pasture management?" the award of **BEST POSTER PRESENTED**.

9-13th SEPT- **Participation** on European Society of Nematologists (ESN) Conference, Ghent, Belgium

22-29th - Sustainable Farm Conference, realized in the frame of the SFARM project in the University of Évora (CES, CLV and Mitra) with the participation of 8 Asian Universities (China, Vietnam, Laos nd Indonesia)

28th SEPT - ICAAM joined the European Researchers Night (NEI) initiative with an initiative at the Alqueva Lake Observatory



OCT

15-16th OCT 2018 - Office of Unimed-Water and Food **visit to Morocco**.

15-16th OCT - **International Conference** on Mediterranean Diet and Gastronomy: Linking innovation, sustainability and health

15-19th OCT - ICAAM Researchers participated in the **6th International Conference on Olive Tree and Olive Products** – OliveBioteq2018 (<https://olivebioteqsevilla2018.com/>), which took place in Seville



NOV

1st NOV - **SANTANDER AWARDS** for Internationalization of Scientific Production of the University of Évora 2017 - Distinguished the Professors Fátima Baptista and Teresa Pinto Correia and the researchers Marta Laranjo and Elsa Lamy, recognizing their work contributing for the Internationalization of the University of Évora

5th NOV - **Evaluation** by the FCT evaluators Panel of – the future centre **MED**

8 -9th NOV – Dissemination Days of the PRODEHESA_MONTADO Cross-border Cooperation Project

20-21th NOV - **Cork/Corcho Stand of ICAAM**, at the III Iberian Congress of the Dehesa and the Montado in IFEBA Badajoz.

29-30th NOV - **III PhD Students Meeting in Environment and Agriculture** in the University of Évora.

30th NOV - XV Meeting of the Iberian Montado - Coordination of the debate on "Payment by results for Adaptive management of Montado post 2020".



DEC

3rd DEC - **Signing of the protocol** between ICAAM and the Municipality of Viana do Alentejo.

6th DEC - **ICAAM Lectures/Invited foreign Researchers.** (Cleber Furlanetto, Paula Garcia Fraile).

10th DEC - **Cheese Tasting** at Mitra-What Emotions are there in a Cheese?

11th DEC - Delegation of the SALTA Region in Argentina **visits ICAAM**



9. ONGOING PROJECTS 2018

In 2018 ICAAM had 29 ongoing International Projects and 57 National Projects. During the year 2018, 21 National and International projects were approved.

PROJECTS APPROVED IN 2018

Title.	Start	End	Responsible	Funded entity	Total	Univ. Evora	Coordinator
Vine Conservation and genetic improvement Program	01/01/2018	31/12/2021	Outro PT	Portugal 2020	356 213€	80 000€	Augusto Vieira Peixe
Pine ENEMY - Exploring the NEMatode-MYcobiota interactions in PineWilt Disease	15/10/2018	14/10/2021	Outro PT	Portugal 2020	230 234€	27 875€	Manuel Galvão de Melo e Mota
Pine host chemistry and environmental factors driving the epidemiology of the pinewood nematode	01/10/2018	30/09/2021	Outro PT	Portugal 2020	239 792€	54 446€	Manuel Galvão de Melo e Mota
TRUST - Social innovation strategies for sustainability transitions	01/09/2018	31/08/2021	Outro PT	Portugal 2020	233 641€	18 587€	Teresa Pinto Correia
Early-life exposure to MYCOtoxins and its impact on health	01/10/2018	30/09/2021	Outro PT	Portugal 2020	239 937€	25 937€	Elsa Leclerc Duarte
SOIL4 EVER : Aumento da produtividade do regadio através do uso sustentado do solo	01/10/2018	30/09/2021	Outro PT	Portugal 2020	233 714€	27 667€	Carlos Alberto Alexandre
OliveTrojan - Olive fly management through symbiosis-based strategies: looking for Trojan horse candidates	01/09/2018	31/08/2021	ICAAM	Portugal 2020	238 344€	238 344€	Tânia Mesquita Nobre
Development of a new virus-based vector to control TSWV in tomato plants	15/10/2018	14/10/2021	ICAAM	Portugal 2020	232 154€	223 404€	Carla Reis Varanda
Control of olive anthracnose through gene silencing and gene expression using a plant	15/10/2018	14/10/2021	ICAAM	Portugal 2020	235 904€	227782	Patrick Queiroz Materatski
Edible bait vaccine for rabbit haemorrhagic disease virus 2 (RHDV2) control in wild rabbits	01/10/2018	30/09/2021	ICAAM	FCT - PTDC	239 980€	15 110€	Elsa Leclerc Duarte
Precision irrigation of cork in intensive production mode	01/01/2018	01/07/2021	ICAAM	Portugal 2020 FEDER - PDR	336 231€	195 548€	Nuno Cabral de Almeida Ribeiro
Horizontal Activities Program under the PI-Supported China Europe Water Platform (CEWP) Lot 5	01/01/2018	31/12/2021	Outro PT	European Commission CEWP 18-20	1 580 000€	437 225€	João Eduardo Gomes Rabaça
Developing knowledge, policy recommendations and strengthening capacities on Water Management and Ecological security in the frame of the China Europe Water Platform (CEWP)_Lot 1	01/01/2018	31/12/2021	Outro UE	European Commission CEWP 18-20	1 940 000€	599 278€	João Eduardo Gomes Rabaça
The role of voles in agroecosystems: linking pest management to biodiversity conservation under environmental change	01/07/2018	31/07/2020	Outro PT	Portugal 2020 FEDER - PDR	230 000€	6 250€	Ricardo Cadete Pita
Mechanized Pruning and continuous harvesting of olive groves of Portuguese varieties	03/04/2018	23/12/2021	ICAAM	Portugal 2020 FEDER - PDR	290 000€	155 215€	António Bento Dias
SPARKLE - Sustainable Precision Agriculture	01/01/2018	31/12/2020	Outro Int.	European Commission – Erasmus +	775 566 €	71 655 €	José Rafael Marques da Silva
LIAISON - Better Rural Innovation: Linking Actors, Instruments and Policies through Networks	01/05/2018	30/11/2022	Outro Int.	European Commission – H2020	5 000 000€	220 187 €	José Rafael Muñoz-Rojas

Title.	Start	End	Responsible	Funded entity	Total	Univ. Evora	Coordinator
ProtecEstenfilio	01/01/2018	23/12/2021	Outro PT	Portugal 2020 FEDER - PDR	484 909€	37 269€	António Bento Dias
Prospective Technologies towards safety improvement of Portuguese traditional meat products.	01/01/2018	01/01/2019	Outro PT	Portugal 2020 FEDER - PDR	190 848€	24 460€	Miguel Santos Elias
FERTIPINEA - Fertilization of pine trees under irrigation and in rainfed regimes	19/07/2017	23/12/2021	Outro PT	Portugal 2020 FEDER - PDR	474 810€	61 452€	Ana Cristina Gonçalves
GO-Meat quality Study of Cachena cattle	01/01/2018	05/12/2022	ICAAM	Portugal 2020 FEDER - PDR	465 747€	169 015 €	Miguel Santos Elias

PROJECTS FUNDED BY EUROPEAN COMMISSION ONGOING ON 2018

Title.	Start	End	Respons.	Programme	Total	Univ. Evora	Coordinator
[1] Horizontal Activities Program under the PI-Supported China Europe Water Platform (CEWP) Lot 5	01/01/2018	31/12/2021	Outro PT	CEWP 2018-2020	1 580 000€	437 225€	João Eduardo Rabaça
[2] Developing knowledge, policy recommendations and strengthening capacities on Water Management and Ecological security in the frame of the China Europe Water Platform (CEWP)_Lot 1	01/01/2018	31/12/2021	Outro UE	CEWP 2018-2020	1 940 000€	599 278€	João Eduardo Rabaça
[3] SPARKLE - Sustainable Precision Agriculture	01/01/2018	31/12/2020	Outro Int.	ERASMUS +	775 566€	71 655€	José Rafael Marques da Silva
[4] LIAISON - Better Rural Innovation: Linking Actors, Instruments and Policies through Networks	01/05/2018	30/11/2022	Outro Int.	H2020	5 000 000€	220 187€	José Rafael Muñoz-Rojas
[5] Sustainable Farming- SFARM	15/10/2017	14/10/2020	Outro Int.	ERASMUS +	997 715€	76 380€	Fátima Folgôa Baptista
[6] ERB Facility - European Raptor Biomonitoring Facility	17/10/2017	16/10/2021	Outro Int.	Action COST	20 000€	5000€	Rui Lourenço
[7] LIFE RELICT - Preserving Continental Laurissilva Relics	01/10/2017	30/09/2022	ICAAM	LIFE	1 673 239€	732 734€	Carlos Pinto Gomes
[8] LIVESEED - Improve performance of organic agriculture by boosting organic seed and plant breeding efforts across Europe	01/01/2017	02/01/2021	Outro Int.	H2020	7 454 839€	121 100€	Birgit Arnholdt-Schmitt
[9] DIVERCROP - Land system dynamics in the Mediterranean basin across scales as relevant indicator for species diversity and local food systems	23/03/2017	22/03/2020	Outro Int.	ARIMNET 2	1 158 000€	57 380€	Teresa Pinto Correia/ Helena Guimaraes
[10] Life Lines - Linear Infrastructure Networks with Ecological Solutions	01/08/2015	31/07/2020	Outro UE	LIFE	5 540 485€	3 324 303€	António Mira
[11] ECOMED - Specialisation process for the ecoengineering sector in the Mediterranean environment. Generation of the necessary feedback between enterprises and universities in a changing climate environment	08/05/2017	27/05/2018	Outro Int.	ERASMUS+	699 943€	100 000€	João Paulo Almeida Fernandes
[12] SoIACE - Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use	01/05/2017	30/04/2022	Outro Int.	H2020	6 000 000€	91 018€	Gottlieb Basch
[13] SAGRI - Sustainable Agriculture	01/11/2016	31/10/2019	Outro Int.	ERASMUS+	1 037 917€	89 260€	Fátima Folgôa Baptista

Title.	Start	End	Respon s.	Program me	Total	Univ. Evora	Coordinator
[14] MONTADO & CLIMATE – A need to Adapt	01/09/2016	01/09/2021	Outro PT	LIFE	2 051 538 €	72 544€	Nuno Almeida Ribeiro
[15] TRUSTEE - Innovative market based Trust for Energy Efficiency investments in industry	01/02/2016	31/01/2019	Outro Int.	H2020	1 409 995€	164 369€	Adélia Oliveira Sousa
[16] CAREERS - Innovative employability guidance for higher education students in the context of European biodiversity management	01/12/2015	30/06/2018	Outro Int.	ERASMUS+	200 000€	27 610€	João Eduardo Rabaça
[17] HNV Link - High Nature value Farming: learning, Innovation and Knowledge	01/12/2015	31/12/2018	Outro Int.	H2020	2 230 218€	148 250€	Teresa Pinto Correia
[18] SALSA - Small farms, small food businesses and sustainable food security	01/12/2015	30/11/2019	ICAAM	H2020	4 958 422€	934 552€	Teresa Pinto Correia
[19] PEGASUS - Public Ecosystem Goods And Services from land management: Unlocking the Synergies	21/11/2014	31/12/2020	Outro Int.	H2020	2 000 000€	70 000€	Teresa Pinto Correia
[20] SUFISA - Sustainable finance for sustainable agriculture and fisheries	01/05/2015	30/04/2019	Outro Int.	H2020	4 863 662€	259 250€	Teresa Pinto Correia
[21] ISQAPER - Interactive Soil Quality Assessment in Europe and China for Agricultural Productivity and Environmental Resilience	21/11/2014	31/12/2020	Outro Int.	H2020	6 015 000€	400 000€	Gottlieb Basch
[22] NEOH - Network for Evaluation of One Health	31/07/2014	31/07/2018	Outro Int.	Action COST	50 000€	5 000€	Maria Manuela Vilhena
[23] TREASURE - Diversity of local European pig breeds and production systems for high quality traditional products and sustainable pork chains	21/11/2014	31/12/2020	Outro Int.	H2020	3 395 986€	84 000€	Rui Charneca
[24] Dairy Care - Biomarker-based Welfare Technologies Working Group	01/03/2014	28/02/2018	Comissão Europeia	Action COST	150 000€	10 000€	Cristina Conceição Pinheiro
[25] IDERCEXA - Investigación, Desarrollo y Energías Renovables para nuevos modelos empresariales en Centro, Extremadura y Alentejo	01/07/2017	31/12/2019	Outro Int.	INTERREG	500 000€	53 333€	Adélia Oliveira Sousa
[26] SABOR SUR - Laboratorio para la innovación en mercados transfronterizos de alimentación y hostelería	01/06/2017	31/12/2018	Outro Int.	INTERREG	140 280€	105 210€	Elsa Lamy
[27] PENVIMA - Plataforma de ENTornos Virtuales para Investigación en MedioAmbiente	01/01/2017	01/01/2019	Outro Int.	INTERREG	1 900 000€	150 000€	Célia Antunes
[28] Life Saramugo - Life Saramugo - Conservation of Saramugo, (<i>Anaocypris hispanica</i>), in the Guadiana river basin	01/07/2014	31/01/2018	Outro PT	Life	1 453 664€	479 681€	Maria Ilhéu
[29] NEWBIE - New Entrant netWork: Business models for Innovation, entrepreneurship and resilience in European agriculture	01/07/2017	01/07/2021	Outro Int.	H2020	1 999 038€	156 332€	Teresa Pinto Correia

PROJECTS FUNDED BY NATIONAL PROGRAMS ONGOING ON 2018

Title.	Start	End	Resp.	Programme	Total	Univ. Evora	Coordinator
[30] Vine Conservation and genetic improvement Program	01/01/2018	31/12/2021	Outro PT	Portugal 2020	356 213€	80 000€	Augusto Vieira Peixe
[31] Pine ENEMY - Exploring the Nematode-MYcobiota interactions in PineWilt Disease	15/10/2018	14/10/2021	Outro PT	Portugal 2020	230 234€	27 875€	Manuel de Melo e Mota
[32] Pine host chemistry and environmental factors driving the epidemiology of the pinewood nematode	01/10/2018	30/09/2021	Outro PT	Portugal 2020	239 792€	54 446€	Manuel de Melo e Mota
[33] TRUST - Social innovation sTRategies for sUSTainability transitions	01/09/2018	31/08/2021	Outro PT	Portugal 2020	233 641€	18 587€	Teresa Pinto Correia
[34] Early-life exposure to MYCOtoxins and its impact on health	01/10/2018	30/09/2021	Outro PT	Portugal 2020	239 937€	25 937€	Elsa Leclerc Duarte
[35] Olive fly management through symbiosis-based strategies: looking for Trojan horse candidates	01/09/2018	31/08/2021	ICAAM	Portugal 2020	238 344€	238 344€	Tânia Mesquita Nobre
[36] Development of a new virus-based vector to control TSWV in tomato plants	15/10/2018	14/10/2021	ICAAM	Portugal 2020	232154	223 404€	Carla Varanda
[37] Control of olive anthracnose through gene silencing and gene expression using a plant	15/10/2018	14/10/2021	ICAAM	Portugal 2020	235904	227 782€	Patrick Materatski
[38] ECOMONTADO XXI - A Agroecologia aplicada ao design do Montado Novo	01/01/2017	31/12/2021	Outro PT	FEDER - PDR2020	153317.69	114988€	Teresa Pinto Correia
[39] Precision irrigation of cork in intensive production mode	01/01/2018	01/07/2021	ICAAM	FEDER - PDR2020	336231.09	195 548€	Nuno Almeida Ribeiro
[40] The role of voles in agroecosystems: linking pest management to biodiversity conservation under environmental change	01/07/2018	31/07/2020	Outro PT	FEDER - PDR2020	230000	6 250€	Ricardo Cadete Pita
[41] Mechanized Pruning and continuous harvesting of olive groves of Portuguese varieties	03/04/2018	23/12/2021	ICAAM	FEDER - PDR2020	290000	155 215€	António Bento Dias
[42] INOVMontado	01/07/2017	21/12/2020	Outro PT	FEDER - PDR2020	156 156€	53 409€	Teresa Pinto Correia
[43] Go Regadio de Precisão	01/09/2017	01/10/2020	Outro PT	FEDER - PDR2020	461 365€	20 898€	João Serrano
[44] AGIR: Water and energy efficiencies assessment in public irrigation projects	05/07/2017	05/07/2020	Outro PT	FEDER - PDR2020	467 194€	79 812€	Madalena Moreira Vasconcelos
[45] GOEfluentes - Efluentes de pecuária: abordagem estratégica à valorização agrónómica/energética dos fluxos gerados na atividade agropecuária	01/09/2017	01/08/2020	Outro PT	FEDER - PDR2020	509 980€	34 868€	Vasco Fitas da Cruz
[46] Técnicas e tecnologia para valorização de subprodutos em olivicultura TECOLIVE	02/11/2017	01/11/2018	ICAAM	FEDER - PDR2020	439 497€	214 546€	José Manuel Peça
[46] Segurança & Qualidade dos Produtos Cárneos Transformados	02/11/2017	01/11/2018	Outro PT	FEDER - PDR2020	464 201€	89 979€	Miguel Santos Elias
[48] GESTÃO INTEGRADA DA COBRILHA DA CORTIÇA (UnderCork)	02/11/2017	01/11/2018	Outro PT	FEDER - PDR2020	448 742€	115 716€	João Eduardo Rabaça
[49] GO SOLO : Promoção de práticas agrícolas conservadoras do solo através da demonstração, expedita e a baixo custo, do seu impacto na matéria orgânica	02/11/2017	01/11/2018	Outro PT	FEDER - PDR2020	429 397€	70 061€	João Manuel Serrano

Title.	Start	End	Resp.	Programme	Total	Univ. Evora	Coordinator
[50] Go BovMais - Melhoria da produtividade da fileira dos bovinos de carne	02/11/2017	01/11/2018	ICAAM	FEDER - PDR2020	-	77 299€	Manuel Cancela D'Abreu
[51] iCheese -Cynara Innovation for best Cheese	02/11/2017	01/11/2018	Outro UE	FEDER - PDR2020	430 122€	7 587€	Cristina Conceição Pinheiro
[52] ProtecEstenfilio	01/01/2018	23/12/2021	Outro PT	FEDER - PDR2020	484 909€	37 269€	António Bento Dias
[53] Prospective Technologies towards safety improvement of Portuguese traditional meat products.	01/01/2018	01/01/2019	Outro PT	FEDER - PDR2020	190 848€	24 460€	Miguel Santos Elias
[54] FERTIPINEA - Fertilization of pine trees under irrigation and in rainfed regimes	19/07/2017	23/12/2021	Outro PT	Portugal 2020 FEDER - PDR2020	474 810€	61 452€	Ana Cristina Gonçalves
[55] GO-Meat quality Study of Cachena cattle	01/01/2018	05/12/2022	ICAAM	FEDER - PDR2020	465 747€	169 015€	Miguel Santos Elias
[56] Viabilização de pastagens semeadas biodiversas através da otimização da fertilização fosfatada	29/11/2016	31/12/2021	Outro PT	FEDER - PDR2020	503 033€	127 855€	João Ramalho Serrano
[57] Avaliação do desempenho da Máquina de Colheita de Azeitona (MCCA)	01/01/2017	01/04/2018	ICAAM	Proder	221 931€	97 004€	António Bento Dias
[58] Promover o Envolvimento de Stakeholders do setor Agroflorestal no Alentejo na Transferência de Conhecimento e em Parcerias no âmbito do Projeto SMARTAgriFor	01/01/2017	31/01/2019	ICAAM	Portugal 2020	249 750€	249 750€	Teresa Pinto Correia
[59] Producing Rice with Low Arsenic Content	01/07/2016	31/06/2019	ICAAM	Alentejo 2020	469 895€	387 830€	Carlos Alexandre
[60] ACUAsave - Conservation Agriculture and Water Efficiency Use	01/01/2017	31/01/2019	ICAAM	Portugal 2020	194 983€	119 160€	Gottlieb Basch
[61] AWARTECH - Animal Welfare Adjusted Real Time Environmental Conditions of Housing	01/09/2016	31/08/2019	Outro PT	Portugal 2020	1 000 000€	449 236€	Vasco Fitas da Cruz
[62] GEN-RES-ALENTEJO - Utilização da Genómica na Selecção de Ovinos Resistentes a Parasitas e Peera no Alentejo	01/01/2017	31/12/2019	Outro PT	Portugal 2020	569 475€	72 381€	Sandra Branco
[63] MAISAGRO	01/09/2016	31/08/2018	Outro PT	Portugal 2020	1 018 013€	151 215€	Miguel Santos Elias
[64] CistusRumen - Utilização sustentável da Esteva (<i>Cistus ladanifer</i> L) em pequenos ruminantes - Aumento da competitividade e redução do impacto ambiental	01/10/2016	30/09/2019	Outro PT	Portugal 2020	697 581€	118 154€	Fernando Capela e Silva
[65] Melhoria da produção de pastagens em solos ácidos no Montado: abordagem química e biológica	01/06/2016	31/05/2019	ICAAM	Portugal 2020	731 835€	554 902€	Mário Carvalho
[66] ValBioTecCynara -Economic Valuation of Cardoon (<i>Cynara cardunculus</i>): Study of natural variability and biotechnological applications	01/06/2016	30/09/2018	Outro PT	Portugal 2020	696 813€	137 547€	Carla Pinto da Cruz Ferreira
[67] SelectPorAl - SelectPorAl-selection and genomic improvement of productive characteristics of Alentejano Pig	01/06/2016	31/05/2019	Outro PT	Portugal 2020	483 915€	52 875€	José Manuel Martins
[68] A Protecção Integrada do olival alentejano. Contributos para a sua inovação e melhoria contra os seus inimigos-chave	01/06/2016	31/05/2019	ICAAM	Portugal 2020	652 516€	575 908€	Fernando Trindade Rei

Title.	Start	End	Resp.	Programme	Total	Univ. Evora	Coordinator
[69] OLEAVALOR - Valuation of varieties of Portuguese olive tree	01/06/2016	31/05/2019	ICAAM	Portugal 2020	781 581€	486 006€	Augusto Peixe
[70] Vegetação mediterrânica: anti-helmínticos naturais na dieta selecionada por cabras em pastoreio	01/10/2016	30/09/2019	ICAAM	Portugal 2020	309 497€	85 153€	Ludovina Neto Padre
[71] Micorrização de Cistus spp. com Terfezia arenaria (Moris) Trappe e sua aplicação na produção de túberas	04/04/2016	31/12/2019	ICAAM	Portugal 2020	251 706€	251 706€	Celeste Santos e Silva
[72] NIR - Efficiency of NIR technology for evaluation of ripening and fruit quality	01/06/2016	31/05/2019	ICAAM	Portugal 2020	337 713€	337 713€	Ana Elisa Rato Barroso
[73] Alentejo Circular - Promoção da economia circular nas explorações agrícolas e agroindústrias do Alentejo	01/11/2016	31/10/2018	Outro PT	Portugal 2020	294 498€	127 818€	Vasco Fitas da Cruz
[74] Reproductive management and biotechnology of reproduction in Lusitano breed horses	01/01/2017	01/01/2019	ICAAM	Portugal 2020	207 045€	195 447€	Elisa Bettencourt
[75] Technical support to the preservation and genetic improvement programs of ruminants	01/01/2017	01/01/2019	ICAAM	Portugal 2020	579 104€	492 478€	Ricardo Romão
[76] New diagnostic methodologies of joint disease in horses	01/01/2017	01/01/2019	ICAAM	Portugal 2020	287 120€	287 120€	Nuno Alexandre
[77] VALREGIA - Viabilização da cultura da nogueira no regadio do Alentejo	01/12/2015	30/11/2018	ICAAM	Portugal 2020	231 369€	231 367€	Augusto Vieira Peixe

PROJECTS FUNDED BY FCT

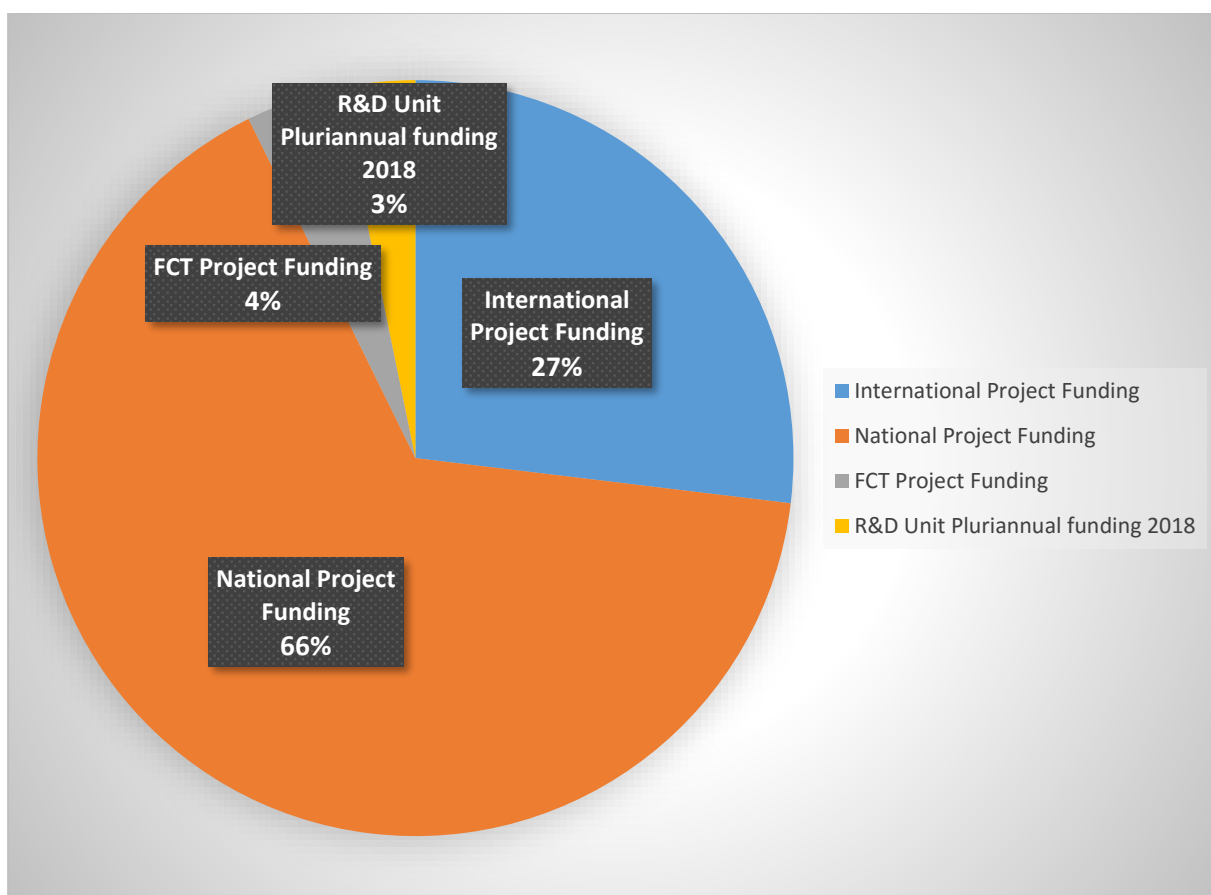
Title.	Start	End	Resp.	Funded entity	Total	Univ. Evora	Coordinator
[78] Edible bait vaccine for rabbit haemorrhagic disease virus 2 (RHDV2) control in wild rabbits	01/10/2018	30/09/2021	ICAAM	PTDC	239 980 €	15 110 €	Elsa Maria Leclerc Duarte
[79] 441.00 Índia - Cooperação FCT/ÍNDIA - Alternative oxidase - a tool to increase biomass productivity under temperature and flooding stress	01/07/2017	31/12/2019	ICAAM	Cooperação Transnacional	4 300 €	2 500 €	Birgit Arnholdt-Schmitt
[80] MedOOmics, Mediterranean Extra Virgin Olive Oil Omics: profiling and fingerprinting	01/09/2016	01/09/2019	ICAAM	ERA NET	102 406 €	102 406 €	Maria João Bastos Cabrita
[81] Uma nova abordagem baseada em bacteriófagos para o controlo da Paenibacillus larvae na Apicultura	11/11/2015	10/11/2018	Outro PT	SFRH	172 442 €	21 600 €	António Coelho Murilhas
[82] Exploiting beneficial associations with chickpea: the role of non-rhizobial endophytic bacteria in the rhizobia-legume symbiosis	01/10/2015	30/09/2018	ICAAM	PTDC	141 762 €	141 762 €	Clarisse Brígido
[83] PratyTech -Biotechnology approaches towards the control of the root lesion nematode Pratylenchus penetrans	01/10/2015	30/09/2018	ICAAM	PTDC	199 552 €	95 306 €	Manuel Galvão de Melo e Mota
[84] Por30 - Portuguese olive oil omics for traceability and authenticity	01/10/2015	30/09/2018	ICAAM	PTDC	198 655 €	177 055 €	Maria João Bastos Cabrita

Title.	Start	End	Resp.	Funded entity	Total	Univ. Evora	Coordinator
[85] POPCONNET - Combining genetic and field-based data to assess the effects of roads on landscape functional connectivity and population viability	03/01/2016	06/01/2019	ICAAM	PTDC	196 427 €	- €	António Mira
[86] SOIL4 EVER : Sustainable use of soil and water for improving crops productivity in irrigated areas	01/10/2018	30/09/2021	Outro PT	PTDC	233 714€	27 667€	Carlos Alexandre

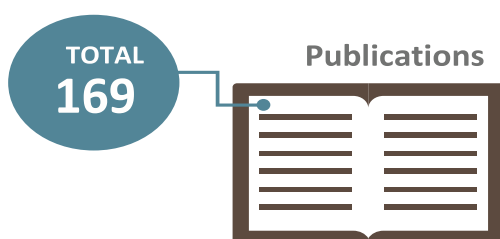
10. FUNDING

During 2018 the ICAAM have received a total funding of around 4.5 million euros, shared between FCT, national and international sources and Pluriannual Funding from FCT by 4%, 66%, 27% and 3%, respectively.

International Project Funding	1 224 097,96 €
National Project Funding	2 994 236,03 €
FCT Project Funding	184 197,33 €
R&D Unit Pluriannual funding 2018	146 666,67 €
TOTAL	4 549 197,99 €



11. PRODUCTION 2018



DESCRIPTION

Indexed Papers (ISI e Scopus)	Books and Books Chapters with referee	Scientific Communications
145	24	154

12. FULL LIST OF PUBLISHED PAPERS 2018

ARTICLES INDEXED IN WEB OF SCIENCE/SCOPUS

1. Alexandre EM, Silva S, Santos SA, Silvestre AJ, **Duarte MF**, Saraiva JA, Pintado M. 2018. *Antimicrobial activity of pomegranate peel extracts performed by high pressure and enzymatic assisted extraction*. Food Research International. [DOI:10.1016/j.foodres.2018.08.044](https://doi.org/10.1016/j.foodres.2018.08.044)
2. **Almeida E**, **Caeiro E**, Todo-Bom A, **Ferro R**, Dionísio A, Duarte A, **Gazarini L**. 2018. *The influence of meteorological parameters on Alternaria and Cladosporium fungal spore concentrations in Beja (Southern Portugal): preliminary results JCR® I.F. (2017): 2.202 Aerobiologia (ISSN 0393-5965)*. Aerobiologia 34:219-226. [DOI:10.1007/s10453-018-9508-8](https://doi.org/10.1007/s10453-018-9508-8)
3. **Alves JC**, Dos SAM, Fernandes D. 2018. *Evaluation of the effect of mesotherapy in the management of back pain in police working dog*. Veterinary Anaesthesia and Analgesia 45:123-128. [DOI:10.1016/j.vaa.2017.07.006](https://doi.org/10.1016/j.vaa.2017.07.006)
4. Alves, M., A. Pereira, **C. Vicente**, P. Matos, J. Henriques, H. Lopes, F. Nascimento, **M. Mota**, A. Correia, and I. Henriques. 2018. *The role of bacteria in pine wilt disease: insights from microbiome analysis*. FEMS Microbiology Ecology, 94 (7), 1 July 2018, fiy077, <https://doi.org/10.1093/femsec/fiy077>.
5. **Andrade JA**, Cadima J, Abreu FM. 2018. *Modeling germination rate and cardinal temperatures of seven Mediterranean crops (Q3 and IF: 0.84)*. Journal of Crop Improvement 32:878-902. [DOI:10.1080/15427528.2018.1542362](https://doi.org/10.1080/15427528.2018.1542362)

6. **Andrade, J**, Silva, T, Trindade, H, Nabais, C. 2018. *Implementing a network of weather and agrometeorological stations: a case study in Timor-Leste (Q3 and IF 0.0488)*. Finisterra - Revista Portuguesa de Geografia 53:108. [DOI:10.18055/Finis13703](https://doi.org/10.18055/Finis13703)
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13. ICAAM MEMBERS 2018

MEMBERS FROM THE GROUP ANIMAL BIOSCIENCES

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
INTEGRATED MEMBERS		
Alfredo Manuel Franco Pereira	PhD	Assistant Professor with Habilitation
Amadeu António Gomes Borges de Freitas	PhD	Assistant Professor
Ana Carina Alves Pereira de Mira Geraldo	PhD	Other
Ana Isabel Usié Chimenos	PhD	Research fellow
António Marcos Costa do Amaral Ramos	PhD	Other
Cristina Maria dos Santos Conceição Pinheiro	PhD	Assistant Professor
Célia Cristina Fialho Leão	PhD	Research fellow
David Orlando Alves Ferreira	PhD	Assistant Professor
Eliana Alexandra Sousa Jerónimo Alves	PhD	Assistant Researcher
Elisa Maria Varela Bettencourt	PhD	Assistant Professor
Elsa Cristina Carona de Sousa Lamy	PhD	Researcher
Elsa Maria Leclerc Duarte	PhD	Assistant Professor
Elsa Rute Guerra Caeiro	PhD	Researcher
Fernando Manuel Salvado Capela e Silva	PhD	Assistant Professor
Hélder Carola Espiguinha Cortes	PhD	Invited Assistant Professor
Isabel Maria Simão Alves Pereira Ferreira	PhD	Assistant Professor
Joana Manuela Capela Pires	PhD	Other
José Luís Tirapicos Nunes	PhD	Associate Professor with Habilitation
Luís Miguel Lourenço Martins	PhD	Assistant Professor
Lénia Isabel Alfaiate Rodrigues	PhD	Research fellow
Manuel D'Orey Cancela D'Abreu	PhD	Associate Professor with Habilitation
Maria Cristina Calhau Queiroga	PhD	Assistant Professor
Maria Elvira Lourido Sales Baptista	PhD	Assistant Professor
Maria Isabel S. A. Ferraz de Oliveira M. Rato	PhD	Assistant Professor
Maria Teresa Carvalho Oliveira de S. Alves	PhD	Invited Assistant Professor
Maria de Fátima Pereira Duarte Ricardo	PhD	Other
Marta Sofia Garcia Candeias	PhD	Other
Nuno Miguel Lourenço Alexandre	PhD	Assistant Professor
Orlando da Silva Lopes	PhD	Assistant Professor
Ricardo Jorge da Costa Trindade P. Romão	PhD	Assistant Professor
Rui Manuel Alves Ferreira	PhD	Associate Professor
Rui Miguel Carracha Charneca	PhD	Assistant Professor
Sandra Maria da Silva Branco	PhD	Assistant Professor
Susana Oliveira Serrano Monteiro	PhD	Assistant Professor
STUDENT MEMBERS		
Ana Sofia Coelho Ramos	Master	Research fellow
António Eduardo Mira Cruz Mendes Pinto	Master	Research fellow
Emanuel Ruben dos Santos Carreira	Master	Invited Assistant

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
João Carlos Agostinho Alves	Master	Other
Maria João Martins Vila-Viçosa	Degree	Technician
Mónica Alexandra Freire Cardoso de Mira	Degree	Other
Nara Patrícia Cavalcanti Andrade	Master	Other
Sílvia Alexandra Macedo Arantes	Master	Research fellow
Sónia Félix Vilas Boas de Lucena	Master	Invited Assistant
Teresa de Jesus Farinha Marques Louro	Master	Other

MEMBERS FROM THE GROUP FOOD SCIENCE AND TECHNOLOGY (FST)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
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INTEGRATED MEMBERS

Ana Cristina Pinto Agulheiro Santos	PhD	Assistant Professor
Ana Elisa de Mendonça Rato Barroso	PhD	Assistant Professor
Ana Maria Ferreira da Silva da Costa Freitas	PhD	Associate Professor with Habilitation
Ana Rita Nunes Martins	PhD	Researcher
Igor Alexandre da Silva Dias	PhD	Assistant Teacher
Ilda Maria Justino Caldeira	PhD	Assistant Researcher
Jelena Milinovic	PhD	Research fellow
José Manuel Mota Ruivo Martins	PhD	Assistant Professor
Maria Eduarda Marques Madeira Silva Potes	PhD	Assistant Professor
Maria João Marinho Lança Silva Almeida	PhD	Assistant Professor with Habilitation
Maria João Pires de Bastos Cabrita	PhD	Assistant Professor with Habilitation
Marta Sofia S. V. Casimiro Ferreira Laranjo	PhD	Research fellow
Miguel Nuno Geraldo Viegas Santos Elias	PhD	Assistant Professor
Raquel Marta Neves dos Santos Garcia	PhD	Research fellow
Sara Maria de Almeida Lopes Canas	PhD	Assistant Researcher with Habilitation

STUDENT MEMBERS

Ana Teresa da Cunha Machado Ribeiro	Master	Assistant Teacher
André Filipe Barreto Albuquerque	Master	Research fellow
Maria Inês Silva Caçador Pereira Rouxinol	Master	Other

MEMBERS FROM THE GROUP PLANT PROTECTION (PP)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
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INTEGRATED MEMBERS

Ana Isabel Pereira Alexandre	PhD	Researcher
Ana Isabel do Paço Teixeira	PhD	Research fellow
Ana Paula Honrado Pinto	PhD	Assistant Professor
Carla Marisa Reis Varanda	PhD	Research fellow

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
Carlos Gutiérrez Gutiérrez	PhD	Research fellow
Clarisse Cordeiro Brígido	PhD	Research fellow
Cláudia Sofia Leite Vicente	PhD	Research fellow
Esther Menéndez Gutiérrez	PhD	Research fellow
Fernando Manuel de Campos Trindade Rei	PhD	Assistant Professor
Isabel Maria de Oliveira Brito	PhD	Assistant Professor
Jorge Miguel Silva Faria	PhD	Research fellow
José Rodrigo da Silva	PhD	Research fellow
Luís Manuel Cardoso Vieira Alho	PhD	Assistant Professor
Manuel Galvão de Melo e Mota	PhD	Associate Professor with Habilitation
Maria Ivone Esteves da Clara	PhD	Full Professor (former)
Maria Margarida Saial S. Guiomar Espada	PhD	Research fellow
Maria do Rosário Fernandes Félix	PhD	Assistant Professor
Mário José G. Pinto Rodrigues Carvalho	PhD	Full Professor
Patrick José de Queiroz Materatski	PhD	Research fellow
STUDENT MEMBERS		
Jordana Pia Cardoso Branco	Master	Research fellow
Luísa Isabel Guerreiro David Coelho	Master	Other
Pedro Miguel de Sousa Barbosa	Degree	Research fellow
Taiana de Araújo Conceição	Master	Other

MEMBERS FROM THE GROUP GENETIC RESOURCES AND FUNCTIONAL GENOMICS (GRFG)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
INTEGRATED MEMBERS		
Ana Rita Pereira da Costa	PhD	Assistant Researcher
Augusto António Vieira Peixe	PhD	Assistant Professor
Birgit Arnholdt-Schmitt	PhD	Researcher (former)
Hélia Cristina Guerra Cardoso	PhD	Research fellow
Isabel de Jesus Pereira Godinho Velada	PhD	Research fellow
José Manuel Godinho Calado	PhD	Other
João Manuel Mota Barroso	PhD	Associate Professor
Liliana Maria Bota Marum	PhD	Other
Maria Catarina M. Rico dos Santos Campos	PhD	Research fellow
Maria Doroteia M. Rico da Costa Campos	PhD	Research fellow
Tânia Mesquita Nobre	PhD	Research fellow

MEMBERS FROM THE GROUP LANDSCAPE, BIODIVERSITY AND SOCIO-ECOLOGICAL SYSTEMS (LABS)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
INTEGRATED MEMBERS		
Amália Maria Marques Espiridião de Oliveira	PhD	Technician
Ana Cristina Andrade Gonçalves	PhD	Assistant Professor with Habilitation
Ana Margarida Pinto da Fonseca	PhD	Research fellow
Anabela Dias Ferreira Belo	PhD	Assistant Professor
António Paulo Pereira Mira	PhD	Assistant Professor
António Pedro de Avelar Gonçalves Santos	PhD	Assistant Professor with Habilitation
Carla Sofia Borges Pinto da Cruz Ferreira	PhD	Assistant Professor
Carlos António Marques Pereira Godinho	PhD	Assistant Researcher
Carlos José Pinto Gomes	PhD	Assistant Professor with Habilitation
Catarina Isabel Rodrigues Meireles	PhD	Assistant Researcher
Cati Oliveira Dinis	PhD	Researcher
Celeste Maria Martins Santos e Silva	PhD	Assistant Professor
Constança de S. e Paiva de Camilo Alves	PhD	Researcher
Diana Surova	PhD	Research fellow
Inês Margarida Ferreira Roque	PhD	Research fellow
José Rafael Muñoz-Rojas Morenés	PhD	Assistant Researcher
João Eduardo Morais Gomes Rabaça	PhD	Assistant Professor with Habilitation
João Paulo Tavares Almeida Fernandes	PhD	Associate Professor with Habilitation
Luiz Carlos Gazarini	PhD	Associate Professor
Luís Alexandre Piteira Gomes	PhD	Research fellow
Margarida Maria de Almeida Vaz	PhD	Assistant Professor
Maria Antónia Pacheco Ilhéu	PhD	Assistant Professor
Maria Helena Marques Enes Guimarães	PhD	Research fellow
Maria Teresa Amado Pinto Correia	PhD	Full Professor
Maria Teresa Folgôa Batista	PhD	Invited Assistant Professor
Maria de Belém F. da Silva da Costa Freitas	PhD	Assistant Professor with Habilitation
Nuno Manuel Cabral de Almeida Ribeiro	PhD	Assistant Professor
Patrícia Miguel Rocha Lourenço	PhD	Research fellow
Paula Rute Pereira Matono Alves	PhD	Research fellow
Paulo Alexandre da Cunha e Sá de Sousa	PhD	Assistant Professor
Rui Nascimento Fazenda Lourenço	PhD	Research fellow
Sérgio Rui Borreicho Coelho Godinho	PhD	Assistant Researcher
STUDENT MEMBERS		
Ana Cristina Pereira da Cruz Galantinho	Master	Other
Ana Patrícia Cebola Poeriras	Master	Research fellow
Bárbara Afonso Pires	Master	Other
Carla Maria Gomes Azeda	Master	Research fellow
Catarina Gormicho B. Marques Esgalhado	Master	Research fellow

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
Elsa Margarida Lourenço de Almeida	Degree	Other
Helene Gichenje	Master	Other
Mauro André Mauricio Raposo	Master	Research fellow
Nuno Ricardo Gracinhas Nunes Guiomar	Master	Researcher
Paola Andrea Hernandez	Master	Research fellow
Paula Virgínia Serra Parreira Banza	Master	Other
Rogério Filipe Agostinho Louro	Master	Research fellow
Rui Daniel Parreira Machado	Master	Other

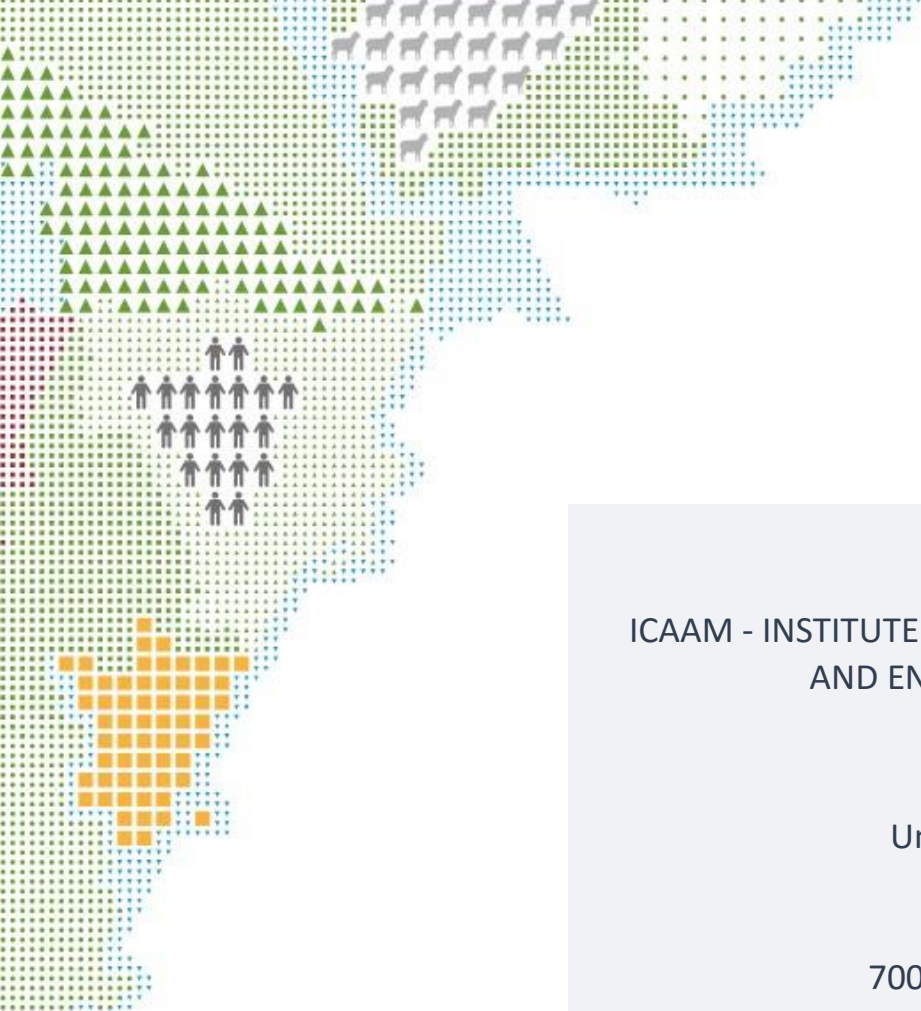
MEMBERS FROM THE GROUP SOIL, WATER AND CLIMATE (SWC)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
INTEGRATED MEMBERS		
Ana Lúcia Pena Barão	PhD	Research fellow
Ana Rita da Silva Prazeres	PhD	Researcher
Elsa Paula F. Ferreira Morgado de Sampaio	PhD	Assistant Professor
Francisco Lúcio R. Borges Brito dos Santos	PhD	Full Professor (former)
Gottlieb Basch	PhD	Associate Professor
Manuel Rijo	PhD	Associate Professor with Habilitation
Maria Madalena V. Moreira Vasconcelos	PhD	Assistant Professor with Habilitation
Paulo Alexandre Justo Fernandez	PhD	Assistant Teacher
Ricardo Paulo Serralheiro	PhD	Full Professor (former)
Rui Manuel de Almeida Machado	PhD	Assistant Professor
Sandra de Jesus Martins Mourato	PhD	Assistant Teacher
Shakib Shahidian	PhD	Assistant Professor
STUDENT MEMBERS		
Fernanda Alexandra Firmino Fiúza	Master	Other

MEMBERS FROM THE GROUP FARMING TECHNOLOGY AND ENERGY EFFICIENCY (FTE)

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
INTEGRATED MEMBERS		
Adélia Maria Oliveira Sousa	PhD	Assistant Professor
Anacleto Cipriano Pinheiro	PhD	Associate Professor
António Fernando Bento Dias	PhD	Assistant Professor
Fátima de Jesus Folgôa Baptista	PhD	Assistant Professor with Habilitation
José Manuel Nobre de Oliveira Peça	PhD	Associate Professor
José Rafael Marques da Silva	PhD	Assistant Professor with Habilitation

NAME	ACADEMIC DEGREE	PROFESSIONAL CATEGORY
João Manuel Pereira Ramalho Serrano	PhD	Assistant Professor with Habilitation
Luís Alcino Pinto Monteiro da Conceição	PhD	Assistant Teacher
Luís Leopoldo de Sousa e Silva	PhD	Assistant Professor with Habilitation
Maria da Conceição Fernandes	PhD	Researcher
Patrícia Maria Azevedo Moniz	PhD	Research fellow
Talita Ferreira Marques da Silva Fernandes	PhD	Research fellow
Vasco Manuel Fitas da Cruz	PhD	Associate Professor
STUDENT MEMBERS		
Teresa da Silva Morgado	Master	Research fellow



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